



ESKAH-13.2 VAX 11/780 (KA780)
MICRODIAG VOL #1

EP-ESKAH-DL-13.2
FICHE 2 OF 7

APR 1983
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IDENTIFICATION

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 PRODUCT TITLE: ESKAH132 VAX 11/780 MICRO DIAGNOSTIC GO CHAIN (VOLUME 1)
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: 1 .NOBIN
: 2 .TOC "STAR MICROCODE"
: 3
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: DOC.MIC[400,4005] 13:21 7-OCT-1977

How to Read the Microcode -- Formats & Constructs

```
18 .PAGE 'How to Read the Microcode -- Formats & Constructs'
19
20 (1) Field Definitions
21 These occur at the beginning of the listing, in the source file
22 DEF.MIC. They have the form:
23 SYMBOL/=J,K,L,M
24 The first parameter (J) is meaningful only when 'D' is specified
25 as the default mechanism, and in that case, gives the default value of
26 the field in hexadecimal.
27 The second parameter (K) gives the field size in (decimal) number
28 of bits.
29 The third parameter (L) gives the field position in decimal
30 as the bit number of the rightmost bit of the field. Bits are numbered
31 from 0 on the right.
32 The fourth parameter (M) is optional, and selects a default
33 mechanism for the field. The legal values of this parameter are the
34 characters 'D', or '+'.
35 'D' means J is the default value of the field if no explicit
36 value is specified.
37 '+' is used on the jump address field to specify that the default
38 jump address is the address of the next instruction assembled (not,
39 in general, the current location +1).
40 In general, a field corresponds to the set of bits which provide
41 select inputs for mixers or decoders, or controls for ALU's.
42 Examples:
43 AMX/=0,2,20,D
44 The microcode field which controls AMX is two bits wide
45 and the rightmost bit is shown in the listing as bit 20 of the
46 microinstruction. If no value is specifically requested for the field,
47 the microassembler will ensure that the field is 0.
48 ALU/=0,4,25
49 The field which controls alu is 4 bits wide, ending on
50 bit 25. The fourth parameter of the field is omitted, so the field
51 is available to the microassembler (if no value is explicitly
52 called out for the field) for modification.
53 (2) Value Definitions
54 Following a field definition, symbols may be created in that
55 field to correspond to values of the field. the form is:
56 SYMBOL=N
57 'N' is, in hex, the value of symbol when used in the field.
58 examples:
59 ALU/=0,4,25 ;Field definition in which following symbols exist
60 XOR=7
61 A+B=8
62 Here the symbols 'XOR' and 'A+B' are defined for the 'ALU' field.
63 To the assembler, therefore, writing 'ALU/XOR' means put the value 7
64 into the 4-bit field ending on bit 25 of the microword. The symbols
65 are chosen for mnemonic significance, of course, so one reading
66 the microcode would interpret 'ALU/XOR' as 'the output of ALU shall be the
67 exclusive or of its A and B inputs'. Similarly, 'ALU/A+B' is read as
68 'ALU produces the sum of A and B'.
69 SCK/=0,1,23,D ;field definition for following symbols
70 NOP=0
71 LOAD=1
72 Here the symbols 'NOP' and 'LOAD' are defined for the field named
73 'SCK', which controls the clocking of the SC register. We could write
```


74 : SCK/NOP in every microinstruction in which we did not want the SC
75 : to change, but to simplify things, we use the default mechanism, which
76 : ensures that unless a microinstruction explicitly specifies a change
77 : to SC (by SCK/LOAD), the assembler will make the value of this field 0.
78 :

79 : (3) Label Definitions

80 : A micro instruction may be labelled by a symbol followed by colon
81 : preceding the microinstruction definition. The address of the
82 : microinstruction becomes the value of the symbol in the field named 'J'.
83 : example:

84 : F00: J/F00

85 : This is a microinstruction whose 'J' field (jump address) contains
86 : the value 'F00'. It also defines the symbol 'F00' to be the address
87 : of itself. Therefore, if executed by the microprocessor, it would
88 : loop on itself.
89 :

90 : (4) Comments

91 : A semicolon anywhere on a line causes the rest of the line
92 : to be ignored by the assembler. This text is an example of comments.
93 :

94 : (5) Microinstruction Definition

95 : A word of microcode is defined by specifying a field name,
96 : followed by slash (/), followed by a value. The value may be a
97 : symbol defined for that field, a hex digit string, or a decimal
98 : digit string (distinguished by the fact that it is terminated by
99 : a period). Several fields may be specified
100 : in one microinstruction by separating field/value specifications with
101 : commas. example:

102 : AMX/LA,BMX/D,ALU/A-B

103 : The field named 'AMX' is given the value named 'LA' (to
104 : cause the mixer on the A side of ALU to select LA), field 'BMX' has value
105 : 'D', field 'ALU' has value 'A-B'.
106 :

106 : (6) Continuation

107 : The definition of a microinstruction may be continued onto two or
108 : more lines by breaking it after any comma. In other words, if the
109 : last non-blank, non-comment character on a line is a comma, the
110 : instruction specification is continued on the following line.
111 : example:

112 : AMX/LA,BMX/D, ;Select LA & D as ALU inputs

113 : ALU/A-B ;Select ALU to perform A-B

114 : By convention, a blank line and a line of hyphens appears between
115 : microinstructions, to make it easier for the reader to distinguish
116 : continuation from separate microinstructions.
117 :

118 : (7) Macros

119 : A macro is a symbol whose value is one or more field/value
120 : specifications and/or macros. A macro definition is a line containing
121 : the macro name followed by a quoted string which is the value of the
122 : macro. example:

123 : D_LA-D "AMX/LA,BMX/D,ALU/A-B,D_ALU"

124 : The appearance of a macro in a microinstruction definition is equivalent
125 : to the appearance of its value. Macros may have parameters, enclosed in
126 : square brackets ('[' and ']'). The definition of a macro with parameters
127 : includes paired brackets to indicate where the parameters should go, and
128 : uses '@' followed by a decimal digit string to indicate which symbols in
129 : the macro body should be replaced by the parameters:

```

130 : RC[]_D+K[] 'AMX/D,KMX/@2,BMX/KMX,ALU/A+B,SPD.RC/@1'
131 : This macro indicates that the first parameter (selected by @1)
132 : should be used as the value in the "SPD.RC" field, and the second parameter
133 : as the value of the "KMX" field. A typical use of this macro might
134 : look like:
135 : RC[T1]_D+K[34]
136 : In this case, the expansion would be 'AMX/D,KMX/34,BMX/KMX,ALU/A+B,SPD.RC/T1'
137 : Macros for various functions are defined in 'MACRO.MIC'.

```

(8) Pseudo Ops

The micro assembler has the following pseudo-operators:

- .UCODE and .DCODE select the ram into which subsequent microcode will be loaded, and therefore the field definitions and macros which are meaningful in subsequent microcode.
- .TITLE defines a string of text to appear in the page header, and
- .TOC defines an entry for the table of contents at the beginning.
- .PAGE starts a new page of listing, and creates a .TOC entry if a quoted string follows the pseudo-op.
- .SET defines the value of a conditional assembly parameter.
- .CHANGE redefines a conditional assembly parameter.
- .DEFAULT assigns a value to an undefined parameter.
- .IF enables assembly if the value of the parameter is not zero.
- .IFNOT enables assembly if the parameter value is zero, and
- .ENDIF re-enables assembly if suppressed by the parameter named.
- .RTOL enables bits numbered from 0 on the right of the microinstruction.
- .HEXADECIMAL enables radix to be 16 instead of default radix 8.
- .REGION defines preferred parts of the .UCODE space.
- .CREF and .NOCREF enable and disable the collection of cross-reference information on symbol usage.
- .LIST and .NOLIST enable and disable output listing.
- .BIN and .NOBIN enable and disable leaving room at the left margin for binary output.
- .MACHINE selects microassembler features needed for special microprocessors.

(9) Location Control

A microinstruction "labelled" with a number is assigned to that address.

The character "=" at the beginning of a line, followed by a string of 0's, 1's, and/or *'s, specifies a constraint on the address of following microinstructions. The number of characters in the constraint string (excluding the "=") is the number of low-order bits constrained in the address. The microassembler attempts to find an unused location whose address has 0 bits in the positions corresponding to 0's in the constraint string and 1 bits where the constraint has 1's. Asterisks denote "don't care" bit positions.

If there are any 0's in the constraint string, the constraint implies a block of $\langle 2^{*N} \rangle$ microwords, where N is the number of 0's in the string. All locations in the block will have 1's in the address bits corresponding to 1's in the string, and bit positions denoted by *'s will be the same in all locations of the block.

In such a constraint block, the default address progression is counting in the '0' positions of the constraint string, but a new constraint string occurring within a block may force skipping over some locations of the block. Within a block, a new constraint string does not change the pattern of default address progression, it merely advances the location counter over those locations. The microassembler will later fill them in.


```

186 : A null constraint string ("=" followed by anything but '0',
187 : '1', or '*') serves to terminate a constraint block.
188 : examples:
189 :     =0
190 :     This specifies that the low-order address bit must be zero--
191 : The microassembler finds an even-odd pair of locations, and puts
192 : the next two microinstructions into them.
193 :     =11
194 :     This specifies that the two low-order bits of the address must
195 : both be ones. Since there are no 0's in this constraint, the
196 : assembler finds only one location meeting the constraint.
197 :     =0****
198 :     This specifies a pair of addresses, the first having a zero in
199 : the '20' bit, and the second having a one in that position, but all
200 : other bit positions the same.

```

201	.PAGE		'Opcodes and Mnemonics'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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257 : 4E CVTLF RL, WF
258 : 4F ACBF RF, RF, MF, BW
259
260 : 50 MOVF RF, WF
261 : 51 CMPE RF, RF
262 : 52 MNEGF RF, WF
263 : 53 TSTF RF
264 : 54 EMOF RF, RB, RF, WL, WF
265 : 55 POLYF RF, RW, AB
266 : 56 CVTFD RF, WD
267 : 57 * RESERVED TO DEC *

268
269 : 58 ADAWI RW, MW
270 : 59 * RESERVED TO DEC *
271 : 5A * RESERVED TO DEC *
272 : 5B * RESERVED TO DEC *
273 : 5C * RESERVED TO DEC *
274 : 5D * RESERVED TO DEC *
275 : 5E * RESERVED TO DEC *
276 : 5F * RESERVED TO DEC *

277 : hex name operands

278
279 : 80 ADDB2 RB, MB
280 : 81 ADDB3 RB, RB, WB
281 : 82 SUBB2 RB, MB
282 : 83 SUBB3 RB, RB, WB
283 : 84 MULB2 RB, MB
284 : 85 MULB3 RB, RB, WB
285 : 86 DIVB2 RB, MB
286 : 87 DIVB3 RB, RB, WB
287
288 : 88 BISB2 RB, MB
289 : 89 BISB3 RB, RB, WB
290 : 8A BICB2 RB, MB
291 : 8B BICB3 RB, RB, WB
292 : 8C XORB2 RB, MB
293 : 8D XORB3 RB, RB, WB
294 : 8E MNEGB RB, WB
295 : 8F CASEB RB, RB, RB
296

297 : 90 MOVB RB, WB
298 : 91 CMPB RB, RB
299 : 92 MCOMB RB, WB
300 : 93 BITB RB, RB
301 : 94 CLRB WB
302 : 95 TSTB RB
303 : 96 INCB MB
304 : 97 DECB MB
305

306 : 98 CVTBL RB, WL
307 : 99 CVTBW RB, WW
308 : 9A MOVZBL RB, WL
309 : 9B MOVZBW RB, WW
310 : 9C ROTL RB, RL, WL
311 : 9D ACBB RB, RB, MB, BW
312 : 9E MOVAB AB, WL

Opcodes and Mnemonics

6E CVTLD RL, WD
6F ACBD RD, RD, MD, BW
70 MOVD RD, WD
71 CMPD RD, RD
72 MNEGD RD, WD
73 TSTD RD
74 EMODD RD, RB, RD, WL, WD
75 POLYD RD, RW, AB
76 CVTDF RD, WF
77 * RESERVED TO DEC *

78 ASHL RB, RL, WL
79 ASHQ RB, RQ, WQ
7A EMUL RL, RL, RL, WQ
7B EDIV RL, RQ, WL, WL
7C CLRQ WQ
7D MOVQ RQ, WQ
7E MOVAQ AQ, WL
7F PUSHAQ AQ

hex name operands

A0 ADDW2 RW, MW
A1 ADDW3 RW, RW, WW
A2 SUBW2 RW, MW
A3 SUBW3 RW, RW, WW
A4 MULW2 RW, MW
A5 MULW3 RW, RW, WW
A6 DIVW2 RW, MW
A7 DIVW3 RW, RW, WW
A8 BISW2 RW, MW
A9 BISW3 RW, RW, WW
AA BICW2 RW, MW
AB BICW3 RW, RW, WW
AC XORW2 RW, MW
AD XORW3 RW, RW, WW
AE MNEGW RW, WW
AF CASEW RW, RW, RW

B0 MOVW RW, WW
B1 CMPW RW, RW
B2 MCOMW RW, WW
B3 BITW RW, RW
B4 CLRW WW
B5 TSTW RW
B6 INCW MW
B7 DECW MW

B8 BISPSW RW
B9 BICPSW RW
BA POPR RW
BB PUSHR RW
BC CHMK RW
BD CHME RW
BE CHMS RW

Opcodes and Mnemonics

313	9F	PUSHAB	AB	BF	CHMU	RW
314	hex	name	operands	hex	name	operands
315						
316	C0	ADDL2	RL, ML	E0	BBS	RL, VB, BB
317	C1	ADDL3	RL, RL, WL	E1	BBC	RL, VB, BB
318	C2	SUBL2	RL, ML	E2	BBSS	RL, VB, BB
319	C3	SUBL3	RL, RL, WL	E3	BBCS	RL, VB, BB
320	C4	MULL2	RL, ML	E4	BBSC	RL, VB, BB
321	C5	MULL3	RL, RL, WL	E5	BBCC	RL, VB, BB
322	C6	DIVL2	RL, ML	E6	BBSSI	RL, VB, BB
323	C7	DIVL3	RL, RL, WL	E7	BBCCI	RL, VB, BB
324						
325	C8	BISL2	RL, ML	E8	BLBS	RL, BB
326	C9	BISL3	RL, RL, WL	E9	BLBC	RL, BB
327	CA	BICL2	RL, ML	EA	FFS	RL, RB, VB, WL
328	CB	BICL3	RL, RL, WL	EB	FFC	RL, RB, VB, WL
329	CC	XORL2	RL, ML	EC	CMPV	RL, RB, VB, RL
330	CD	XORL3	RL, RL, WL	ED	CMPZV	RL, RB, VB, RL
331	CE	MNEGL	RL, WL	EE	EXTV	RL, RB, VB, WL
332	CF	CASEL	RL, RL, RL	EF	EXTZV	RL, RB, VB, WL
333						
334	D0	MOVL	RL, WL	F0	INSV	RL, RL, RB, VB
335	D1	CMPL	RL, RL	F1	ACBL	RL, RL, ML, BW
336	D2	MCOML	RL, WL	F2	AOBLSS	RL, ML, BB
337	D3	BITL	RL, RL	F3	AOBLEQ	RL, ML, BB
338	D4	CLRL	WL	F4	SOBGEO	ML, BB
339	D5	TSTL	RL	F5	SOBGTR	ML, BB
340	D6	INCL	ML	F6	CVTLB	RL, WB
341	D7	DECL	ML	F7	CVTLW	RL, WW
342						
343	D8	ADWC	RL, ML	F8	ASHP	RB, RW, AB, RB, RW, AB
344	D9	SBWC	RL, ML	F9	CVTLP	RL, RW, AB
345	DA	MTPR	RL, RL	FA	CALLG	AB, AB
346	DB	MFPR	RL, WL	FB	CALLS	RL, AB
347	DC	MOVPSL	WL	FC	XFC	
348	DD	PUSHL	RL	FD	ESCD	* RESERVED TO DEC *
349	DE	MOVAL	AL, WL	FE	ESCE	* RESERVED TO DEC *
350	DF	PUSHAL	AL	FF	ESCF	* RESERVED TO DEC *

Operand Specifier Codes

351 .PAGE 'Operand Specifier Codes'

352	Hex	Name	R	M	W	A	V	Index
353	-----							
354	0-3	Literal	y	f	f	f	f	f
355	4	Indexed	y	y	y	y	y	f
356	5	Register	y	y	y	f	y	f
357	6	Register deferred	y	y	y	y	y	y
358	7	Autodecrement	y	y	y	y	y	ux
359	8	Autoincrement	y	y	y	y	y	ux
360	9	Autoincrement deferred	y	y	y	y	y	ux
361	A	Byte Displacement	y	y	y	y	y	y
362	B	Byte Displacement deferred	y	y	y	y	y	y
363	C	Word Displacement	y	y	y	y	y	y
364	D	Word Displacement deferred	y	y	y	y	y	y
365	E	Longword Displacement	y	y	y	y	y	y
366	F	Longword Displacement deferred	y	y	y	y	y	y

367
368
369 :Floating Literals

370	Hex	Value	Hex	Value	Hex	Value	Hex	Value
371	-----							
372	00	- 1/2	01	- 9/16	02	- 5/8	03	- 11/16
373	04	- 3/4	05	- 13/16	06	- 7/8	07	- 15/16
374	08	- 1	09	- 1 1/8	0A	- 1 1/4	0B	- 1 3/8
375	0C	- 1 1/2	0D	- 1 5/8	0E	- 1 3/4	0F	- 1 7/8
376	10	- 2	11	- 2 1/4	12	- 2 1/2	13	- 2 3/4
377	14	- 3	15	- 3 1/4	16	- 3 1/2	17	- 3 3/4
378	18	- 4	19	- 4 1/2	1A	- 5	1B	- 5 1/2
379	1C	- 6	1D	- 6 1/2	1E	- 7	1F	- 7 1/2
380	20	- 8	21	- 9	22	- 10	23	- 11
381	24	- 12	25	- 13	26	- 14	27	- 15
382	28	- 16	29	- 18	2A	- 20	2B	- 22
383	2C	- 24	2D	- 26	2E	- 28	2F	- 30
384	30	- 32	31	- 36	32	- 40	33	- 44
385	34	- 48	35	- 52	36	- 56	37	- 60
386	38	- 64	39	- 72	3A	- 80	3B	- 88
387	3C	- 96	3D	- 104	3E	- 112	3F	- 120

ZZ-ESKAH-V132 Fixed Address Allocation
: DOC.MIC[400,4005] 13:21 7-OCT-1977

N 1

SEQ 0012

Fixed Address Allocation

	.PAGE	'Fixed Address Allocation'
: 389		
: 390		
: 391	: 1000	UNEXPECTED MICRO TRAP ERROR CALL
: 392	: 104E	'ERROR1' CALL TO CONSOLE
: 393	: 105A	'ERROR2' CALL TO CONSOLE
: 394	: 105E	INSTRUCTION THAT CALLS THE CONSOLE
: 395	: 1100 110F	MICRO TRAP ENTRIES
: 396	: 1155	MICRO ECO TAGET (FROM 12AA)
: 397	: 12AA	ECO'D LOCATION
: 398	: 13F0 13FF	SCRATCH LOCATIONS USED BY THE LSI-11

Control Store Field Map

```
399 .PAGE "Control Store Field Map"
400
401 *
402 | 15 14 13 12| 11 10 09 08| 07 06 05 04| 03 02 01 00|
403 |-----|
404 | EALU | JMP |
405 |-----|
406
407
408 *
409 | 31 30 29 28| 27 26 25 24| 23 22 21 20| 19 18 17 16|
410 |-----|
411 | IEK | MSC | VAK|FEK|SCK| CCK | EBMX | SMX |
412 |-----|
413
414
415 *
416 | 47 46 45 44| 43 42 41 40| 39 38 37 36| 35 34 33 32|
417 |-----|
418 | ADS| MCT/CID | FS| SPO | PCK |
419 |-----|
420
421
422 *
423 | 63 62 61 60| 59 58 57 56| 55 54 53 52| 51 50 49 48|
424 |-----|
425 | KMX | SI/ACM | QK | SGN |
426 |-----|
427
428
429 *
430 | 79 78 77 76| 75 74 73 72| 71 70 69 68| 67 66 65 64|
431 |-----|
432 | DT |RMX| BEN | ACF | ALU | SUB |
433 |-----|
434
435
436 *
437 | 95 94 93 92| 91 90 89 88| 87 86 85 84| 83 82 81 80|
438 |-----|
439 | IBC | DK | SHF | BMX | AMX |
440 |-----|
```

Branch Enable Functions

31-January-77

441	.PAGE	'Branch Enable Functions'			
442					
443	BEN:	Name	UPC<02>	UPC<01>	UPC<00>
444					
445	0	NOP	0	0	0
446					
447	1	Z	0	0	ALU Z
448					
449	2	ROR	LA<01>	PSL<C>	LA<00>
450					
451	3	C31	0	ALU C31	0
452					
453	4				
454					
455	5				
456					
457	6	ACcelerator	ACC UB2	ACC UB1	ACC UB0
458					
459	7				
460					
461	8	DATA TYPE	0= Normal	2= Field Src	Read +
462	VAX:	1= Q + D	3= Addr Src	ASRC +	ASRC +
463				VSRC	Q + D
464	8	END DP1	Read +	0 Class	J Class +
465	-11		Modify		DM27
466					
467	9	IR2-1	0	IR<2>	IR<1>
468	VAX:				
469					
470	9	PC Modes	0	SM or DM	Dst R
471	-11			47 + 57	.eq. PC
472					
473	A	REI	Mode .lt.		
474			ASTLVL		
475					
476	B	IB TEST	0	IB running	IB ERROR +
477		0= TB Miss 2= Stall			DATA VALID
478		1= Error 3= Data OK			
479	C	MUL	SC.ne.0	D<01>	D<00>
480					
481	D	SIGNS	Q<31>	D.ne.0	D<31>
482					
483	E	INTERRUPT	AC Low	Internal	Interrupt
484				Interrupt	Request
485					
486	F	Decimal	0	D<7:0>	D<3:0>=
487				30-39	0B + 0D
488					
489	BEN:	Name	UPC<03>	UPC<02>	UPC<01>
490					UPC<00>
491	10	uTrap Vector	uVECT<3>	uVECT<2>	uVECT<1>
492					uVECT<0>
493	11	Last	-PSL<FPD>	Nested	Wr Chk*
494		Reference		Error	-Intlk
495					-Read+
496	12	EALU CC	EALU N	EALU Z	Sign Src

Branch Enable Functions

497	13					
498	14	SC 0= Zero 2= 1-31 1= Neg 3= .gt.31	0	SC<9:8> .ne.0	SC.gt.0	SC<9:5> .ne.0
500	15	ALU1-0 (previous cycle)	Rlog Empty	ALU<1:0> .eq.0	ALU<01>	ALU<00>
502	16	STATE7-4	STATE<7>	STATE<6>	STATE<5>	STATE<4>
503	17	STATE3-0	STATE<3>	STATE<2>	STATE<1>	STATE<0>
504	18	D Bytes	D<31:24> .ne.0	D<23:16> .ne.0	D<15:8> .ne.0	D<7:0> .ne.0
505	19	D3-0	D<03>	D<02>	D<01>	D<00>
506	1A	PSL CC	PSL<N>	PSL<Z>	PSL<V>	PSL<C>
507	1B	ALU CC	ALU N	ALU Z	IR<0>	ALU C31

518	BEN:	Name	UPC<04>	UPC<03>	UPC<02>	UPC<01>	UPC<00>
519	1C	PSL Mode	-VAMX<31>	-VAMX<30>	-Console Mode	-PSL<IS>* -PSL<CM>	Kernel Mode
520	1D	Translation Test	PTE - Valid	Data Aligned	0	TB Miss + Access Viol	TB Miss + 1st Modify
521	1E						
522	1F						

Memory Control Functions

;October 11, 1976

534 .PAGE 'Memory Control Functions'

535
536
537
538
539
540
541
542
543

		--- trap on ---																
		F	U	N	C	H	S	M	C	P	L	B	D	B	C	I	S	
		V	C	E	A	I	E	A	I	U	A	P	P	E				
A	D	MCT	F	T	C	V	S	S	G	G	F	D	A	A	R			
S	3210	S	P	N	K	E	S	S	E	N	M	R	R	R	R			

Y = utrap on condition
* = utrap on condition unless MSC/
SECOND.REF or RETRY.NO.TRAP
N = do not utrap on condition
- = hardware behaviour undefined.
ucode must prevent condition

544 0 0000 0:V: R: N: N: N: N: N: N: N: Y: N: N: TEST.RCHK
545 0 0001 0:V: N: N: N: N: N: N: N: N: N: N: N: MEM.NOP
546 0 0010 0:V: W: N: N: N: N: N: N: N: Y: N: N: TEST.WCHK
547 0 0011 0:V: N: N: N: N: N: N: N: N: N: N: N:
548
549 0 0100 0:V: N: N: N: N: N: N: N: N: N: N: N:
550 0 0101 0:V: W: N: Y: N: -: -: N: -: Y: N: Y: WRITE.V.NOCHK
551 0 0110 0:V: W: W: Y: Y: Y: *: *: Y: Y: Y: N: Y: WRITE.V.WCHK
552 0 0111 0:V: IW: N: -: -: -: -: -: -: Y: N: Y: LOCKWRITE.V.XCHK
553
554 0 1000 0:V: R: R: Y: Y: Y: *: *: N: Y: Y: Y: Y: READ.V.RCHK
555 0 1001 0:V: R: N: Y: N: -: -: N: -: Y: Y: Y: READ.V.NOCHK
556 0 1010 0:V: R: W: Y: Y: Y: *: *: Y: Y: Y: Y: Y: READ.V.WCHK
557 0 1011 0:V: R: IB: Y: Y: Y: Y: Y: Y: Y: Y: Y: Y: READ.V.IBCHK
558
559 0 1100 0:V: R: R: N: N: N: N: N: N: Y: N: N: N: READ.V.NEWPC
560 0 1101 0:V: IR: N: Y: N: -: -: N: -: Y: Y: Y: LOCKREAD.V.NOCHK
561 0 1110 0:V: IR: W: Y: Y: Y: -: -: Y: -: Y: Y: Y: LOCKREAD.V.WCHK
562 0 1111 0:V: N: N: N: N: N: N: N: N: N: N: N:
563
564 1 0000 0:V: HOLD: N: N: N: N: N: N: N: N: N: N: SBI.HOLD
565 1 0001 0:V: UNJAM: N: N: N: N: N: N: N: N: N: N: SBI.HOLD+UNJAM
566 1 0010 0:P: INVAL: N: N: N: N: N: N: N: N: N: N: INVALIDATE
567 1 0011 0:P: VAL: N: N: N: N: N: N: N: N: N: N: VALIDATE
568
569 1 0100 0:P: EXTWR: N: N: N: N: N: N: N: N: N: Y: EXTWRITE.P
570 1 0101 0:P: W: N: N: N: N: N: N: N: N: N: Y: WRITE.P
571 1 0110 0:P: N: N: N: N: N: N: N: N: N: Y:
572 1 0111 0:P: IW: N: N: N: N: N: N: N: N: N: Y: LOCKWRITE.P
573
574 1 1000 0:P: R: N: N: N: N: N: N: N: N: N: Y: READ.P
575 1 1001 0:P: R: N: N: N: N: N: N: N: N: N: Y:
576 1 1010 0:P: ISR: N: N: N: N: N: N: N: N: N: Y: READ.INT.SUM
577 1 1011 0:P: ISR: N: N: N: N: N: N: N: N: N: Y:
578
579 1 1100 0:P: IR: N: N: N: N: N: N: N: N: N: Y: LOCKREAD.P
580 1 1101 0:P: IR: N: N: N: N: N: N: N: N: N: Y:
581 1 1110 0:P: R: N: N: N: N: N: N: N: N: N: N: ALLOW.IB.READ
582 1 1111 0:P: R: N: N: N: N: N: N: N: N: N: N:
583
584 0 XXXX 1:V: N: N: N: N: N: N: N: N: N: N: NO MEMORY OPERATION
585 1 XXXX 1:I: R: N: N: N: N: N: N: N: N: N: N: DEFAULT: ALLOW IB READ
586
587 : Abort Ref on Trap? A A A A A A R A (A=any, R=read)

: The left column lists first the ID bus register name, and in parenthesis
: its address. If the register is also accessible by MIPR and MFPR inst-
: ructions, the Internal Register Number and symbolic name are also given.

	31/15	30/14	29/13	28/12	27/11	26/10	25/09	24/08	23/07	22/06	21/05	20/04	19/03	18/02	17/01	16/00
IBUF (00)	Data Byte 3								Data Byte 2							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	Data Byte 1								Data Byte 0							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
DAY.TIM (01)	Time Byte 3								Time Byte 2							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
IR 1B 'TDDR'	Time Byte 1								Time Byte 0							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SYS.ID (03)	ID 31	ID 30	ID 29	ID 28	ID 27	ID 26	ID 25	ID 24	ID 23	ID 22	ID 21	ID 20	ID 19	ID 18	ID 17	ID 16
IR 3E 'SID'	ID 15	ID 14	ID 13	ID 12	ID 11	ID 10	ID 9	ID 8	ID 7	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0
RXCS (04)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IR 2D 'RXCS'	0	0	0	0	0	0	0	0	Done	Intrpt Enable	0	0	0	0	0	0
RXDB (05)	Data Byte 3								Data Byte 2							
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
IR 21 'RXDB'	Data Byte 1								Data Byte 0							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
TXCS (06)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IR 22 'TXCS'	0	0	0	0	0	0	0	0	Ready	Intrpt Enable	0	0	0	0	0	0
TXDB																

644	(07)	Data Byte 3								Data Byte 2							
645		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
646	IR 23																
647	'TXDB'	Data Byte 1								Data Byte 0							
648		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
649																	
650																	
651	DQ																
652	(08)									D(read) Q(write)							
653		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
654										D(read) Q(write)							
655		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
656																	
657																	
658																	
659	NXT.PER																
660	(09)									Next Interval							
661		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
662	IR 19																
663	'NICR'									Next Interval							
664		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
665																	
666																	
667	CLK.CS																
668	(0A)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
669	IR 18																
670	'ICCS'	Error	0	0	0	0	0	0	0	Intprt Req	Intprt Enable	Single Clock	Xfer	0	0	0	Run
671																	
672																	
673																	
674																	
675	INTERVAL																
676	(0B)									Count (microseconds)							
677		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
678	IR 1A																
679	'ICR'									Count (microseconds)							
680		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
681																	
682		31/15	30/14	29/13	28/12	27/11	26/10	25/09	24/08	23/07	22/06	21/05	20/04	19/03	18/02	17/01	16/00
683	CES																
684	(0C)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Nested Error
685																	
686	IR 13																
687	'ASTR'	Control	Store	Parity	Error	EALU	EALU	ALU	ALU	ALU	Arithmetic			Perf			
688	IR 3D	Summary	2	1	0	N	Z	N	Z	C31	Trap Code			Mon En	AST Level		
689	'PME'																
690																	
691	VECTOR																
692	(0D)	0	0	0	0	0	0	Prior Valid	Priority			Number of Ones					
693																	
694		0	0	0	0	0	0	0	08	07	06	05	Vector 04	03	02	01	00
695																	
696																	
697																	
698																	
699	SIR																

700	(OE)	0	0	0	0	0	0	0	0	0	0	0	Interrupt Priority Level				
701													Active				
702	IR 15	Software Interrupt Register															
703	"SISR"	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
704																	
705																	
706																	
707	PSL																
708	(OF)	Compat	Trace			FPD	Intrpt	Current	Previous				Interrupt Priority Level				
709		Mode	Pend	0	0		Stack	Mode	Mode	0							
710	IR 12																
711	"IPL"									Decmal	Float	Intger			Condition Code		
712		0	0	0	0	0	0	0	0	oVrflo	Undflo	oVrflo	T	N	Z	V	C
713																	
714																	
715	TBUF																
716	(10)	Valid	Protection Code				Modify	0	0	0	0	0	20	Page Frame Number			
717																	
718																	
719																	
720		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
721																	
722		31/15	30/14	29/13	28/12	27/11	26/10	25/09	24/08	23/07	22/06	21/05	20/04	19/03	18/02	17/01	16/00
723	TBER0																
724	(12)												Replac	Force	Replace	Force	TB Miss
725		0	0	0	0	0	0	0	0	0	0	0	Both	G1	G0	G1	G0
726																	
727					Last Reference					TB Hit			Force TB				Mem
728		FS	ADS	MCT3	MCT2	MCT1	MCT0	IBWCHK	AR	G1	G0	0	Parity Error				Man En
729																	
730																	
731	TBER1																
732	(13)												1D2	1D1	1D0	0D2	0D1
733		0	0	0	0	0	0	0	0	0	0	0					
734																	
735			TB Parity Error Bits					CP TB					Bad		IPA		
736		0D0	1A2	1A1	1A0	0A2	0A1	0A0	PE	0	Last	0	IPA	Miss	PE	Prot E	Auto L
737																	
738																	
739	ACC.MN																
740	(16)	Write	Trap Address														
741		Trp Ad	0	0	0	0	0	0	0								
742																	
743		Write	Micro	Micro-break (write)													
744		uBreak	Match	0	0	0	0	0		Current Address (read)							
745																	
746																	
747	ACC.CS																
748	(17)																
749		Error	0	0	0	Resrvd	0	0	0	0	0	0	0	0	0	0	0
750	IR 28					Opvand											
751	"ACCS"	Accel	Accelerator Type														
752		Enable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
753																	
754																	
755	SILO																

756	(18)	After Fault	SBI Intlk	4	3	SBI ID	2	1	0	2	SBI TAG	1	0	M3/B31	M2/B30	M1/B29	M0/B28	CNF1	CNF0
757	IR 31																		
758	"SBIS"																		
759		15	14	13	12	11	10	9	8	SBI TR	7	6	5	4	3	2	1	0	
760																			
761																			
762																			
763	SBI.ERR																		
764	(19)																		
765		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
766	IR 34																		
767	"SBIER"	RDS Int En	CRD	RDS	CP TO	CP TO ST1	CP TO STO	0	CP Err CNF	IB RDS	IB TO	IB TO ST1	IB TO STO	IB Err CNF	Mult Error	Not Busy	0		
768																			
769																			
770	TIME.ADR																		
771	(1A)	Mode	Prot Check	0	29	28	27	26	25	Physical Address									
772		1	0							24	23	22	21	20	19	18			
773	IR 35																		
774	"SBITA"																		
775																			
776		17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2		
777																			
778																			
779	FAULT																		
780	(1B)	Parity Fault	0	Unexp RD	0	Mult Xmit	Xmit Fault	0	0	0	0	0	0	Fault Latch	Fault Int En	Fault Signal	Fault Lock		
781	IR 30																		
782	"SBIFS"																		
783		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
784																			
785																			
786																			
787	COMP																		
788	(1C)	Silo Lock	Silo Int En	Lock Uncond	Cond Lock Code	Compare Command or Mask					Compare Tag				Count				
789	IR 32																		
790	"SBISC"																		
791		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
792																			
793																			
794																			
795	MAINT																		
796	(1D)	Rev P0	Wr Seq Fault	Unexp RD	Mult Xmit	4	Maintenance ID				1	0	Force SBI Invalid	Enable	Reverse Cache Parity			Force MissGO	
797	IR 33																		
798	"SBIMT"	Force MissG1	Force Rep G0	Force Rep G1	Disabl SBI	Rev P1	G1 Match	G0 Match	Force TO	0	0	0	0	0	0	0	0		
799																			
800																			
801																			
802																			
803	PARITY																		
804	(1E)																		
805		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
806																			
807		Any Error	CP Error	G1 B0	G1 B1	G1 B2	G1 B3	G0 B0	G0 B1	G0 B2	G0 B3	G0 B0	G0 B1	G0 B2	G1 B0	G1 B1	G1 B2		
808																			
809																			
810	USTACK																		
811		31/15	30/14	29/13	28/12	27/11	26/10	25/09	24/08	23/07	22/06	21/05	20/04	19/03	18/02	17/01	16/00		

ID Bus Map

812	(20)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813																	
814																	
815																	
816				12	11	10	9	8	7	6	5	4	3	2	1	0	
817																	
818																	
819	UBREAK																
820	(21)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
821																	
822	IR 3C																
823	'MBRK'																
824		0	0	0	12	11	10	9	8	7	6	5	4	3	2	1	0
825																	
826																	
827	WCS.ADDR																
828	(22)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
829																	
830	IR 2C																
831	'WCSA'	Invert	Mod 3														
832		Parity	Counter	12	11	10	9	8	7	6	5	4	3	2	1	0	
833																	
834																	
835	WCS.DATA																
836	(23)	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data
837		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
838	IR 2D																
839	'WCSD'	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data	Data
840		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
841																	
842																	
843																	

: Number of microwords used: 0, Highest= -1

END

ZZ-ESKAH-V132 ID Bus Map

K 2

SEQ 0022

	Location	Line	Number	Index		
:	2	3	4	5	6	7
: Ucode Loc'n	0	1				

U 0000

No errors detected

End of microcode assembly

21 pages of listing

Used 10.27 seconds, 6 pages of core

Symbol table: 0P

Text strings: 0P

Loc'n assignment: 0P

Cross reference: 0P

ZZ-ESKAH-V132 Control ROM Field Definitions

```

.NOCREF
.TOC "Control ROM Field Definitions" ;28 April 77
.NOBIN ;DON'T LEAVE LISTING SPACE FOR BINARY
.RTOL ;BITS NUMBERED FROM 0 ON THE RIGHT OF A FIELD
.HEXADECIMAL ;RADIX 16

```

;FIELDS ARRANGED ALPHABETICALLY

```

ACF/=<71:70> ;ACCELERATOR CONTROL
NOP=0
SYNC=1
TRAP=2
CONTROL=3 ;ACCELLERATOR-DEPENDENT CONTROL FUNCTION

```

```

ACM/=<57:55> ;ACCELERATOR MISCELLANEOUS CONTROL
PWR.UP=0
ABORT=1 ;RETURN ACCEL TO MONITORING IRD
POLY.DONE=6

```

```

ADS/=<47:47> ;ADDRESS SELECT
VA=0
IBA=1

```

```

ALU/=<69:66>,.Default = 0F ;ALU CONTROL FUNCTIONS

```

```

A-B=00
A-B.RLOG=01
A-B-1=02
INST.DEP=03 ;INSTRUCTION DEPENDENT
A+B+1=04
A+B=05
A+B.RLOG=06
ORNOT=07 ;A .OR. .NOT. B
XOR=08 ;A .XOR. B
ANDNOT=09 ;A .AND. .NOT. B
NOTA=0A ;.NOT. A
A+B+PSL.C=0B
OR=0C ;A .OR. B
AND=0D ;A .AND. B
B=0E
A=0F

```

```

AMX/=<81:80> ;AMX TO ALU
LA=0
RAMX=1
RAMX.SXT=2 ;RAMX SIGN EXTENDED ACCORDING TO DT
RAMX.OXT=3 ;RAMX ZERO EXTENDED. OXT(L)=0

```

```

NOP=0      :NO BRANCH
Z=1        :ALU Z
ROR=2      :LA<1>, PSL<C>, LA<0>
C31=3      :ALU C31, 0
IRD=4      :BC4-2, BC4-1, BC4-0
ACCEL=6    :CODE FROM ACCELERATOR
DATA.TYPE=8:(VAX MODE) *, ASRC+VSRC, ASRC+Q+D
           :0--NORMAL, 1--QUAD OR DOUBLE
           :2--FIELD, 3--ADDRESS
END.DP1=8  :(-11 MODE) *, 0 CLASS, J CLASS+DM27
IR2-1=9    :(VAX MODE) *, IR<2:1>
PC.MODES=9 :(-11 MODE) *, SM47+SM57+DM47+DM57, DST R=PC
REI=0A     :(VAX MODE) MODE.LSS.ASTLVL, *, *
SRC.PC=0A  :(-11 MODE) SRC R=PC
IB.TEST=0B :0--TB MISS, 1--ERROR
           :2--STALL, 3--DATA OK
MUL=0C     :SC.NE.0, D<1:0>
SIGNS=0D   :Q<31>, D.NE.0, D<31>
INTERRUPT=0E:AC LOW, INTERNAL INTERRUPT, INT REQ
DECIMAL=0F :0, D BYTE 0 VALID DIGIT, D2-0 NEG SIGN
UTRAP=10   :MICROTRAP DISPATCH VECTOR
LAST.REF=11:-FPD, NESTED ERROR, LOW TWO BITS:
           :0--READ INTERLOCK, 1--READ, READ CHK
           :2--WRITE, 3--READ, WRITE CHK
EALU=12    :EALU N, EALU Z, SC.NEQ.0, SS
SC=14      :SC<9:8>.NE.0, SC.GT.0, SC<9:5>.NE.0
ALU1-0=15  :RLOG EMPTY, ALU<1:0>=0, ALU<1>, ALU<0>
           : (ALU BITS FROM PREVIOUS STATE)
STATE7-4=16:STATE <7:4>
STATE3-0=17:STATE <3:0>
D.BYTES=18 :BYTES 3, 2, 1, 0 OF D.NE.0
D3-0=19    :D<3:0>
PSL.CC=1A  :N,Z,V,C OF PSL
ALU=1B     :ALU N, ALU Z, IR<0>, ALU C31
PSL.MODE=1C:-VA<31:30>, -CONSOLE, IS+CM, KERNEL
TB.TEST=1D :PTE VALID, ALIGNED, QUAD, +
           :0--TRANSLATION OK, 1--WR CHK AND M=0

```

BMX/= <84:82>

:BMX TO ALU

```

MASK=0     :A 0 IN THE BIT SELECTED BY SC<4:0>
PC.OR.LB=1 :LB UNLESS R=PC, THEN PC
PACKED.FL=2:PACKED FLOATING
LB=3
LC=4
PC=5
KMX=6
RBMX=7     :D OR 0

```

ZZ-ESKAH-V132 Control ROM Field Definitions

```

NOP=0          ;DEFAULT
LOAD.UBCC=1    ;SAMPLE ALU & EALU CONDITIONS
SET.V=2        ;FORCE V, NO EFFECT ON N, Z, C
TST.Z=3        ;CLR Z IF ALU.NE.0,
               ;SET N FROM AMX[UDT]
ROR=4          ;SET N & Z FROM ALU, C FROM AMX 00
N+Z.ALU=5      ;SET N AND Z FROM ALU[UDT]
C.AMX0=6       ;OTHERS UNAFFECTED
INST.DEP=7

CID/=<45:42>    ;CONSOLE & ID BUS CONTROL IF FS/1
NOP=1          ;DEFAULT, ALLOW AUTO IB READ
ACK=5          ;SET CONSOLE ACKNOWLEDGE FLAG
CONT=7         ;CLEAR CONSOLE MODE
READ.SC=9      ;READ ID BUS REG SELECTED BY SC
READ.KMX=0B    ;READ ID BUS REG SELECTED BY UKMX
WRITE.SC=0D    ;WRITE REG SELECTED BY SC
WRITE.KMX=0F   ;WRITE REG SELECTED BY UKMX

DK/=<91:88>
NOP=0          ;DEFAULT, HOLD
LEFT2=1        ;DOUBLE SHIFT LEFT
RIGHT2=2       ;DOUBLE SHIFT RIGHT
DIV=4          ;IF NOT ALU CRY, SHIFT LEFT
               ;ELSE LOAD FROM SHF
LEFT=5         ;SHIFT LEFT
RIGHT=6        ;SHIFT RIGHT
SHF=8          ;LOAD SHF MUX, INTEGER FORMAT
SHF.FL=9       ;LOAD SHF MUX, UNPACKED FLOATING FORMAT
ACCEL=0A       ;LOAD ACCELERATOR DATA FROM DF BUS
BYTE.SWAP=0B   ;REFLECT BYTES AROUND BIT 16
Q=0C          ;LOAD Q THRU DAL
DAL.SC=0D      ;LOAD DAL[SC]
DAL.SV=0E      ;LOAD DAL[SHF VAL]
CLR=0F         ;LOAD ZEROS

DT/=<79:78>,.DEFAULT=0 ;DATA TYPE
                     ;CONTROLS AMX SIGN/ZERO EXTENDER, SHF AMOUNT,
                     ;CONDITION CODE SETTING, AND MEMORY REFERENCES
LONG=0         ;DEFAULT
WORD=1
BYTE=2
INST.DEP=3     ;INSTRUCTION DEPENDENT --
               ;ANY OF ABOVE, OR QUAD/DOUBLE

```


ZZ-ESKAM-V132 Control ROM Field Definitions

C 3

SEQ 0026

```

A=0
OR=1
ANDNOT=2
B=3
A+B=4
A-B=5
A+1=6
NABS.A-B=7                ;-ABS(A-B)

EBMX/=<19:18>                ;EBMX TO EALU
FE=0                        ;DEFAULT
KMX=1
AMX.EXP=2
SHF.VAL=3                  ;SHIFT VALUE

FEK/=<24:24>                ;FE REGISTER CONTROL
NOP=0                      ;DEFAULT, HOLD
LOAD=1

FS/=<42:42>                 ;FUNCTION SELECT FOR 43-46
MCT=0                      ;ENABLE MEMORY CONTROL
CID=1                      ;ENABLE ID BUS AND CONSOLE CONTROL

IEK/=<31:30>                ;INTERRUPT AND EXCEPTION ACKNOWLEDGE
NOP=0
ISTR=1                    ;STROBE INTERRUPT REQUESTS
IACK=2                    ;INTERRUPT ACKNOWLEDGE
EACK=3                    ;EXCEPTION ACKNOWLEDGE

IBC/=<95:92>                ;IBUF CONTROL FUNCTIONS
NOP=0                      ;DEFAULT
STOP=1
FLUSH=2                   ;FLUSH IB AND LOAD IBA
START=3
CLR.0.1=4                ;CLEAR BYTES 0,1 (-11 OPCODE)
CLR.2.3=5                ;CLEAR BYTES 2,3 (-11 ISTREAM DATA)
BDEST=7                  ;TRANSFER BRANCH DISPLACEMENT
CLR.0=0C                 ;CLEAR BYTE 0 (VAX OPCODE)
CLR.1=0D                 ;CLEAR BYTE 1 (VAX SPECIFIER)
CLR.0-3=0E               ;CLEAR BYTES 0-3 (-11 OP & DATA)
CLR.1-5.COND=0F          ;CLEAR BYTES 1-5 CONDITIONALLY
                        ; IF THERE IS NO SPECIFIER EVALUATION,
                        ; CLEAR NOTHING. IF A SELF-CONTAINED
                        ; SPECIFIER, CLEAR IT. IF IMMEDIATE,
                        ; ABSOLUTE, OR DISPLACEMENT, CLEAR THE
                        ; ISTREAM LITERAL.

```

ZZ-ESKAH-V132 Control ROM Field Definitions

D 3

SEQ 0027

IBUF=0	:RD	:SPECIFIER/LITERAL DATA FROM IB
DAY.TIME=1	:RD+WR	:CURRENT TIME OF DAY...
		: MUST READ UNTIL STOPS CHANGING
SYS.ID=3	:RD	:SYSTEM IDENTIFICATION
RXCS=4	:RD+WR	:CONSOLE RECIEVE CONTROL/STATUS
RXDB=5	:RD	:CONSOLE RECIEVE DATA BUFFER
		: (TO-ID REGISTER)
TXCS=6	:RD+WR	:CONSOLE TRANSMIT CONTROL/STATUS
TXDB=7	:WR	:CONSOLE TRANSMIT DATA BUFFER
		: (FROM-ID REGISTER)
DQ=8		:DATA PATH D/Q REGISTERS (MAINT ONLY)
NXT.PER=9	:WR	:INTERVAL CLOCK NEXT PERIOD REGISTER
CLK.CS=0A	:RD+WR	:INTERVAL CLOCK CONTROL/STATUS
INTERVAL=0B	:RD	:CURRENT INTERVAL COUNT
CES=0C	:RD+WR	:CPU ERROR/STATUS
VECTOR=0D	:RD+WR	:EXCEPTION & INTERRUPT CONTROL
SIR=0E	:RD+WR	:SOFTWARE INTERRUPT REGISTER
PSL=0F	:RD+WR	:PROCESSOR STATUS LONGWORD
TBUF=10		:TRANSLATION BUFFER DATA
TBER0=12		:TB ERROR/STATUS 0
TBER1=13		:TB ERROR/STATUS 1
ACC.0=14		:ACCELERATOR REGISTER #0
ACC.1=15		:ACCELERATOR REGISTER #1
ACC.2=16		:ACCELERATOR REGISTER #2
ACC.CS=17		:ACCELERATOR CONTROL/STATUS
SILO=18		:NEXT ITEM FROM SBI HISTORY
SBI.ERR=19		:SBI ERROR REGISTER
TIME.ADDR=1A		:SBI TIMEOUT ADDRESS
FAULT=1B		:FAULT/STATUS
COMP=1C		:SBI SILO COMPARATOR
MAINT=1D		:SBI MAINTENANCE
PARITY=1E		:CACHE PARITY
USTACK=20		:MICROSTACK
UBREAK=21		:MICRO BREAK
WCS.ADDR=22		
WCS.DATA=23	:WR	:WRITING WCS COUNTS ADDRESS

```
POBR=24      ;PROCESS SPACE 0 BASE REGISTER
P1BR=25      ;PROCESS SPACE 1 BASE REGISTER
SBR=26       ;SYSTEM SPACE BASE REGISTER
KSP=28       ;KERNEL STACK POINTER
ESP=29       ;EXEC STACK POINTER
SSP=2A       ;SUPERVISOR STACK POINTER
USP=2B       ;USER STACK POINTER
ISP=2C       ;INTERRUPT STACK POINTER
FPDA=2D
D.SV=2E
Q.SV=2F

T0=30        ;GENERAL TEMPS
T1=31
T2=32
T3=33
T4=34
T5=35
T6=36
T7=37
T8=38
T9=39

PCBB=3A      ;PROCESS CONTROL BLOCK BASE
SCBB=3B      ;SYSTEM CONTROL BLOCK BASE
POLR=3C      ;PROCESS 0 LENGTH REGISTER
P1LR=3D      ;PROCESS 1 LENGTH REGISTER
SLR=3E       ;SYSTEM LENGTH REGISTER
```

```
J/= <12:0> ,.nextaddress ;NEXT MICRO WORD ADDRESS, DEFAULT IS THE
                          ;FOLLOWING MICRO WORD
                          ;SYMBOLS ARE DEFINED BY ":"
```



```

.8=0      :#8 FROM FK
.1=1      :#1 FROM FK
.2=2      :#2 FROM FK
.3=3      :#3 FROM FK
.4=4      :#4 FROM FK
SP1.CON=5 :SPECIFIER 1 CONSTANT
SP2.CON=6 :SECIFIER 2 CONSTANT (-11 MODE)
ZERO=6    : OR ZEROS (VAX MODE)
SC=7      :SC[9:0] FROM FK
;8 - 3F:  CONSTANTS (1 CYCLE SETUP IF ALU IN ARITH MODE)
          ;DECIMAL VALUE OF CONSTANT
.14=8     :20      (AF,JL,MH)
.A0=9     :160     (AF,JL)
.34=0A    :52      (AF)
.28=0B    :40      (AF)
.40=0C    :64      (AF,JL,MH,TF)
.50=0D    :80      (AF,MH)
.3000=0E  :12288   (JL)
.EF=0F    :239     (JL)
.80=10    :128     (AF,JL,MH,TF)
.8000=11  :-32768  (AF)
.FF=12    :255     (MH,TF)
.FF00=13  :-256    (MH,AF,JL)
.1E=14    :30      (AF)
.3F=15    :63      (MH,AF,TF)
.7F=16    :127     (AF,MH)
.7=17     :7       (MH,CM,AF,TF)
.F=18     :15      (MH,AF,JL,TF)
.10=19    :16      (MH,TF)
.FFE8=1A  :-24     (CM,JL,TF,MH)
.FFF0=1B  :-16     (CM,TF,MH)
.FFF8=1C  :-8      (CM,JL,MH,TF)
.20=1D    :32      (CM,AF,MH,TF)
.30=1E    :48      (MH,AF,TF)
.18=1F    :24      (CM)
.3FF=20   :1023    (CM,JL,TF,MH)
.C=21     :12      (TF)
.D=22     :31      (AF,JL,MH,TF)
.1F=23    :7936    (JL,MH)
.1F00=24  :176     (CM)
.B0=25    :124     (AF)
.E003=26  :-32     (JL)
.7C=27    :96      (TF)
.FFE0=28  :?       (JL)
.60=29    :-17     (AF)
SPARE=2A  :-15     (AF)
.DFCF=2B  :25      (AF)
.FFEF=2C  :-7      (AF)
.FFF1=2D
.19=2E
.FFF9=2F

```

.FFFF=30	:-1	(MH,JL,TF)
.88=31	:136	(AF)
.3030=32	:?	(TF)
.F0=33	:240	(TF)
.C0=34	:192	(TF,MH)
.6=35	:6	(CM,JL,TF)
.9=36	:9	(CM)
.FFF6=37	:-10	(CM)
.FFF5=38	:-11	(CM)
.1A=39	:26	(CM,AF,TF)
.24=3A	:36	(CM,MH)
.1B=3B	:27	(CM,AF,TF)
.FFFC=3C	:-4	(CM,TF,MH)
.A=3D	:10	(AF,MH)
.7E=3E	:126	(AF,TF)
SPARE=3F		

ZZ-ESKAH-V132 Control ROM Field Definitions

TEST.RCHK=00	:TEST TBUF WITH READ CHECK
MEM.NOP=02	:NEITHER CPU NOR IB GETS MEM CYCLE
TEST.WCHK=04	:TEST TBUF WITH WRITE CHECK
WRITE.V.NOCHK=0A	:WRITE, INHIBIT TRAPS
WRITE.V.WCHK=0C	:WRITE, NORMAL VARIETY
LOCKWRITE.V.XCHK=0E	:INTERLOCK WRITE, VIRTUAL ADDRESS
READ.V.RCHK=10	:READ, NORMAL VARIETY
READ.V.NOCHK=12	:READ, INHIBIT TRAPS
READ.V.WCHK=14	:READ FOR MODIFY
READ.V.IBCHK=16	:READ, CHECK CONTROLLED BY IBUFFER
READ.V.NEWPC=18	:BEGIN NEW INSTRUCTION STREAM
	: DATA GOES TO INSTRUCTION BUFFER
LOCKREAD.V.NOCHK=1A	:INTERLOCK READ, INHIBIT CHECK
LOCKREAD.V.WCHK=1C	:INTERLOCK READ, NORMAL VARIETY
SBI.HOLD=20	:STOP ALL SBI ACTIVITY
SBI.HOLD+UNJAM=22	:RESET SBI
INVALIDATE=24	:CLEAR CACHE ENTRIES
VALIDATE=26	:MICRODIAGNOSTIC FORCE VALID
EXTWRITE.P=28	:EXTENDED WRITE TO CLEAR MOS ERRORS
WRITE.P=2A	:WRITE, PHYSICAL
LOCKWRITE.P=2E	:INTERLOCK WRITE, PHYSICAL
READ.P=32	:READ, PHYSICAL
READ.INT.SUM=36	:INTERRUPT SUMMARY READ
LOCKREAD.P=3A	:INTERLOCK READ, PHYSICAL
ALLOW.IB.READ=3E	:GIVE IB A CYCLE IF IT WANTS ONE

MSC/=<29:26>

NOP=0	:DEFAULT
CHK.CHM=01	:CREATE NEW PSL FOR CHM
CHK.FLT.OPR=02	:UTRAP IF ALU<15>=1, ALU<14:7>=0
CHK.ODD.ADDR=03	
IRD=04	:THIS STATE IS INSTRUCTION DECODE
LOAD.STATE=05	
LOAD.ACC.CC=06	:TAKE CONDITION CODES FROM ACCELERATOR
READ.RLOG=07	: (AND POP RLOG STACK)
CLR.FPD=08	:CLEAR PSL<FPD> BIT
SET.FPD=09	:SET SAME
CLR.NEST.ERR=0A	:CLR NESTED ERROR FLAG IN CPU STATUS
SET.NEST.ERR=0B	:SET SAME
SECOND.REF=0C	:OF UNALIGNED DATA REFERENCE
RETRY.NO.TRAP=0D	:APPLY SAVED CONTEXT, INHIBIT TRAPS
RETRY.TRAP=0E	:APPLY SAVED CONTEXT TO THIS REF
INH.CM.ADDR=0F	:ALLOW USE OF FULL 32-BIT ADDRESS

ZZ-ESKAH-V132 Control ROM Field Definitions

1 3

SEQ 0032

```

NOP=0                                ;DEFAULT
PC_VA=1
PC_IBA=2
VA+4=3                                ;VA_VA+4
PC+1=4                                ;PC_PC+1
PC+2=5                                ;PC_PC+2
PC+4=6                                ;PC_PC+4
PC+N=7                                ;PC_PC+N, N IS DETERMINED BY INSTR BUFFER

```

```

QK/=<54:51>
NOP=0                                ;DEFAULT, HOLD
LEFT2=1                               ;DOUBLE SHIFT LEFT 2
RIGHT2=2                              ;DOUBLE SHIFT RIGHT 2
LEFT=5
RIGHT=6
SHF=8
SHF_FL=9
DEC.CON=0A

ACCEL=0B
D=0C
ID=0E
CLR=0F

;LOAD SHF, INTEGER FORMAT
;LOAD SHF, UNPACKED FLOATING FORMAT
;DECIMAL CONSTANT = 6'S IN EACH NIBBLE
;FOR WHICH ALU CRY OUT IS FALSE
;LOAD ACCELERATOR DATA FROM DF BUS

;LOAD ID BUS
;LOAD ZERO

```

```

RAMX/=<77:77>                        ;DATA PATH MIXER TO AMX
D=0                                  ;DEFAULT
Q=1
RBMX/=<77:77>                        ;DATA PATH MIXER TO BMX. SAME BIT AS RAMX
Q=0
D=1

```

ZZ-ESKAH-V132 Control ROM Field Definitions

```

NOP=0                                ;DEFAULT, HOLD
LOAD=1                               ;LOAD SMX<09:00>

SGN/=<50:48>                          ;SIGN CONTROLS
NOP=0                                ;DEFAULT
LOAD.SS=1                            ;SS_ALU<15>
SS.FROM.SD=2                         ;SS_SD
NOT.SD=3                             ;SD_NOT SD
SD.FROM.SS=4                         ;SD_SS
SS.XOR.ALU=5                         ;SD_ALU<15>, SS_SS.XOR.ALU<15>
ADD.SUB=6                            ;SD_ALU<15>, SS_SS.XOR.ALU<15>.XOR.IR<1>
CLR.SD+SS=7                          ;CLEAR BOTH

SHF/=<87:85>                          ;ALU SHIFTER CONTROLS
ALU=0                                ;DEFAULT, SHF_ALU
LEFT=1                               ;SHF_ALU(L1), INSERT SI CNTL
RIGHT=2                              ;SHF_ALU(R1), INSERT SI CNTL
ALU.DT=3                             ;SHF_ALU(DT: L0,L1,L2,L3), INSERT 0
RIGHT2=4                             ;SHF_ALU(R2), INSERT SI CNTL
LEFT3=5                              ;SHF_ALU(L3)

SI/=<57:55>..default = 3              ;SHIFT INPUT CONTROLS
                                     ;
                                     ; SHF    D    Q
                                     ; ---    -    -
                                     ; PSL<N>  Q31  ALU C31
                                     ; ALU 31  Q0   Q31
                                     ; 0      0    D31
                                     ; 0      0    0
                                     ;
                                     ; Q31    Q31  ALU C31
                                     ; 0      ALU 0,1 0
                                     ; 1      ALU 0,1 1

DIVD=0
ASHR=1
ASHL=2
ZERO=3
SPARE=4
DIV=5
MUL+=6
MUL-=7

SMX/=<17:16>                          ;MIXER TO SC
EALU=0                                ;EALU <9:0>
FE=1                                  ;FE<9:0>
ALU=2                                 ;ALU<09:00>
ALU.EXP=3                             ;ALU<14:07>

```

ZZ-ESKAH-V132 Control ROM Field Definitions

K 3

SEQ 0034

```

NOP=0                                ;DEFAULT
LOAD.LC.SC=6                         ;LOAD LC, ADR=SC[03:00]
WRITE.RC.SC=7                       ;WRITE RC, ADR=SC[03:00]

SPO.AC/=<41:38>                       ;4 FUNCTION BITS OF SPO FIELD
LOAD.LAB=1                          ;LOAD LA, LB FROM R(ACN)
LOAD.LA=2                           ;LOAD LA RN, HOLD LB
WRITE.RAB=3                         ;WRITE RA, RB (ACN)

SPO.ACN/=<37:35>                      ;AC NUMBER IN SPO FIELD
;VAX MODE
SP1.SP1=0                           ;0    SP1 R    RB
SP2.SP2=1                           ;1    SP2 R    SP1 R
SP2.SP1=2                           ;2    SP2 R    SP2 R
PRN=3                               ;3    PRN     SP1 R
PRN+1=4                             ;4    PRN+1   PRN
SC=5                                ;5    SC<03:00> PRN+1
SP1+1=6                             ;6    SP1 R+1  SC<03:00>
                                      ;        SP1 R+1

SPO.ACN11/=<37:35>                   ;AC NUMBER IN SPO FIELD -- 11 MODE
;-11 MODE
SRC.SRC=0                           ;0    SRC R    RB
DST.DST=1                           ;1    DST R    SRC R
DST.SRC=2                           ;2    DST R    DST R
;SRC.SRC=3                          ;3    SRC R    SRC R
SRC.OR.1=4                          ;4    SRC R .OR. 1 SRC R .OR. 1
SC=5                                ;5    SC<03:00> SC<03:00>

SPO.R/=<41:39>                       ;SCRATCH PAD FUNCS WITH LOW 4 BITS OF SP AS ADR
LOAD.LC=2                           ;LOAD LC, ADR=SPO.RN
WRITE.RC=3                          ;WRITE RC
LOAD.LAB=4                          ;LOAD LA, LB
WRITE.RAB=5                         ;WRITE RA, RB
LOAD.LAB1.WRITE.RC=6                ;LOAD LA, LB[R1], AND WRITE RC[RN]
LOAD.LC.WRITE.RAB1=7                ;LOAD LC[RN], AND WRITE RA, RB[R1]

```



```

R0=0
R1=1
R2=2
R3=3
R4=4
R5=5
R6=6
R7=7
AP=0C
FP=0D
SP=0E
R15=0F
SPO.RC/= <38:35>
T0=0
T1=1
T2=2
T3=3
T4=4
T5=5
T6=6
T7=7
LC.SV=8
VA.SV=9
PTE.VA=0A
PTE.PA=0B
PC.SV=0C
SC.SV=0D
VA.REF=0E
MBIT.VA=0F
PTE.MASK=0F

;R12 = ARGUMENT LIST POINTER
;R13 = STACK FRAME POINTER
;R14 = STACK POINTER
;R15 = PC, TO SOFTWARE, SCRATCH TO UCODE
;RC LOCATIONS

;MEM MGMT SAVES LC HERE

SUB/= <65:64>
NOP=0
CALL=1
RET=2
SPEC=3

;SUBROUTINE CONTROL
;DEFAULT
;PUSH UPC OF THIS MICROINSTRUCTION
;ONTO USTACK
;OR TOP OF USTACK TO UPC
;AND POP USTACK
;REPLACE LOW 8 BITS OF NEXT
;UPC WITH SPECIFIER DECODE FROM

VAK/= <25:25>
NOP=0
LOAD=1

;DEFAULT
;LOAD VA

.BIN
.LIST
;RE-ENABLE LISTING SPACE FOR BINARY OUTPUT

```


;ALU_0... THRU ALU_D.AND...

ALU_0(A) ;'AMX/RAMX.0XT,DT/LONG,ALU/A''
 ALU_0[D] ;'ALU/@1,AMX/RAMX.0XT,DT/LONG,BMX/RBMX,RBMX/D''
 ALU_0-D ;'AMX/RAMX.0XT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B''
 ALU_0-D-1 ;'AMX/RAMX.0XT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B-1''
 ALU_0+D ;'AMX/RAMX.0XT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A+B''
 ALU_0-K[] ;'AMX/RAMX.0XT,DT/LONG,KMX/@1,BMX/KMX,ALU/A-B''
 ALU_0-K[]-1 ;'KMX/@1,BMX/KMX,AMX/RAMX.0XT,DT/LONG,ALU/A-B-1''
 ALU_0+K[] ;'KMX/@1,BMX/KMX,AMX/RAMX.0XT,DT/LONG,ALU/A+B''
 ALU_0+K[]+1 ;'KMX/@1,BMX/KMX,AMX/RAMX.0XT,DT/LONG,ALU/A+B+1''
 ALU_0+LB+1 ;'AMX/RAMX.0XT,DT/LONG,BMX/LB,ALU/A+B+1''
 ALU_0+LC ;'AMX/RAMX.0XT,DT/LONG,BMX/LC,ALU/A+B''
 ALU_0-LC ;'AMX/RAMX.0XT,DT/LONG,BMX/LC,ALU/A-B''
 ALU_0+LC+1 ;'AMX/RAMX.0XT,DT/LONG,BMX/LC,ALU/A+B+1''
 ALU_0-LC-1 ;'AMX/RAMX.0XT,DT/LONG,BMX/LC,ALU/A-B-1''
 ALU_0+MASK+1 ;'AMX/RAMX.0XT,DT/LONG,BMX/MASK,ALU/A+B+1''
 ALU_0+Q ;'AMX/RAMX.0XT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A+B''
 ALU_0-Q ;'AMX/RAMX.0XT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B''
 ALU_0-Q-1 ;'AMX/RAMX.0XT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B-1''
 ALU_0+Q+1 ;'AMX/RAMX.0XT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A+B+1''
 ALU_-1 ;'AMX/RAMX.0XT,DT/LONG,ALU/NOTA''
 ALU_D ;'RAMX/D,AMX/RAMX,ALU/A''
 ALU_D.0XT[] ;'RAMX/D,AMX/RAMX.0XT,DT/@1,ALU/A''
 ALU_D.0XT[].AND.K[] ;'RAMX/D,AMX/RAMX.0XT,DT/@1,KMX/@2,BMX/KMX,ALU/AND''
 ALU_D.0XT[].ANDNOT.K[] ;'ALU/ANDNOT,AMX/RAMX.0XT,DT/@1,RAMX/D,BMX/KMX,KMX/@2''
 ALU_D.0XT[]+K[] ;'RAMX/D,AMX/RAMX.0XT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B''
 ALU_D.0XT[]-K[] ;'RAMX/D,AMX/RAMX.0XT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B''
 ALU_D.0XT[]+LC ;'ALU/A+B,AMX/RAMX.0XT,DT/@1,RAMX/D,BMX/LC''
 ALU_D.0XT[]+Q ;'ALU/A+B,AMX/RAMX.0XT,DT/@1,RAMX/D,BMX/RBMX,RBMX/Q''
 ALU_D.0XT[]-Q ;'RAMX/D,AMX/RAMX.0XT,DT/@1,RBMX/Q,BMX/RBMX,ALU/A-B''
 ALU_D.AND.K[] ;'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND''
 ALU_D.AND.MASK ;'RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND''
 ALU_D.ANDNOT.K[] ;'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT''
 ALU_D.ANDNOT.MASK ;'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ANDNOT''
 ALU_D.ANDNOT.Q ;'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT''


```

ALU_D(B)      'RBMX/D,BMX/RBMX,ALU/B''
ALU_D[]K[]    'RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/@1''
ALU_D+K[]     'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B''
ALU_D-K[]     'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B''
ALU_D+K[]+1   'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B+1''
ALU_D-K[]-1   'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1''
ALU_D-LB      'RAMX/D,AMX/RAMX,BMX/LB,ALU/A-B''
ALU_D[]LC     'RAMX/D,AMX/RAMX,BMX/LC,ALU/@1''
ALU_D+LC      'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B''
ALU_D-LC      'RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B''
ALU_D-LC-1    'RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B-1''
ALU_D+LC+PSL.C 'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B+PSL.C''
ALU_D.OR.K[]  'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR''
ALU_D.OR.LC   'RAMX/D,AMX/RAMX,BMX/LC,ALU/OR''
ALU_D.ORNOT.MASK 'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT''
ALU_D.OR.Q    'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR''
ALU_D[]Q      'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1''
ALU_D+Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B''
ALU_D-Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B''
ALU_D+Q+1     'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B+1''
ALU_D-Q-1     'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B-1''
ALU_D+Q+PSL.C 'ALU/A+B+PSL.C,AMX/RAMX,BMX/RBMX,RBMX/Q,RAMX/D''
ALU_D.SXT[]   'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A''
ALU_D.SXT[]AND.K[] 'RAMX/D,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/AND''
ALU_D.SXT[]+K[] 'RAMX/D,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B''
ALU_D.XOR.K[] 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR''
ALU_D.XOR.LC  'RAMX/D,AMX/RAMX,BMX/LC,ALU/XOR''
ALU_D.XOR.Q   'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/XOR''
ALU_D.XOR.R[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LAB,SPO.RAB/@1,BMX/LB,ALU/XOR''
ALU_D.XOR.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/XOR''

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ALU_K[]      'KMX/@1,BMX/KMX,ALU/B''
ALU_LA       'AMX/LA,ALU/A''
ALU_LA.AND.K[] 'AMX/LA,KMX/@1,BMX/KMX,ALU/AND''
ALU_LA.ANDNOT.K[] 'AMX/LA,KMX/@1,BMX/KMX,ALU/ANDNOT''
ALU_LA.ANDNOT.MASK 'AMX/LA,BMX/MASK,ALU/ANDNOT''
ALU_LA.XOR.LC 'AMX/LA,BMX/LC,ALU/XOR''
ALU_LA[]D    'AMX/LA,RBMX/D,BMX/RBMX,ALU/@1''
ALU_LA-D     'AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B''
ALU_LA-D-1   'AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B-1''
ALU_LA+K[]   'AMX/LA,KMX/@1,BMX/KMX,ALU/A+B''
ALU_LA-K[]   'AMX/LA,KMX/@1,BMX/KMX,ALU/A-B''
ALU_LA+K[]+1 'ALU/A+B+1,AMX/LA,BMX/KMX,KMX/@1''
ALU_LA+K[].RLOG 'AMX/LA,KMX/@1,BMX/KMX,ALU/A+B.RLOG''
ALU_LA-K[].RLOG 'AMX/LA,KMX/@1,BMX/KMX,ALU/A-B.RLOG''
ALU_LA[]LB   'AMX/LA,BMX/LB,ALU/@1''
ALU_LA+LC    'ALU/A+B,AMX/LA,BMX/LC''
ALU_LA[]Q    'AMX/LA,RBMX/Q,BMX/RBMX,ALU/@1''
ALU_LA+Q     'ALU/A+B,AMX/LA,BMX/RBMX,RBMX/Q''
ALU_LA-Q     'ALU/A-B,AMX/LA,BMX/RBMX,RBMX/Q''
ALU_LA-Q-1   'ALU/A-B-1,AMX/LA,BMX/RBMX,RBMX/Q''
ALU_LB       'BMX/LB,ALU/B''
ALU_LC       'BMX/LC,ALU/B''
ALU_NOT.D    'ALU/NOTA,AMX/RAMX,RAMX/D''
ALU_NOT.RC[] 'SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT''
ALU_PACK.FP  'BMX/PAKED.FL,ALU/B''
ALU_PC       'BMX/PC,ALU/B''
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ALU_Q      'RAMX/Q,AMX/RAMX,ALU/A''
ALU_Q.0XT[] 'RAMX/Q,AMX/RAMX.0XT,DT/@1,ALU/A''
ALU_Q.0XT[].ANDNOT.K[] 'ALU/ANDNOT,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.0XT[].OR.K[] 'ALU/OR,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.0XT[].OR.D 'ALU/OR,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/RBMX,RBMX/D''
ALU_Q.0XT[]+D 'ALU/A+B,AMX/RAMX.0XT,DT/@1,BMX/RBMX,RBMX/D,RAMX/Q''
ALU_Q.0XT[]+D+1 'ALU/A+B+1,AMX/RAMX.0XT,DT/@1,BMX/RBMX,RAMX/Q,RBMX/D''
ALU_Q.0XT[]+K[] 'ALU/A+B,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.0XT[]-K[] 'ALU/A-B,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.AND.K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND''
ALU_Q.ANDNOT.MASK 'RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ANDNOT''
ALU_Q.ANDNOT.K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT''
ALU_Q(B) 'RBMX/Q,BMX/RBMX,ALU/B''
ALU_Q[]D 'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/@1''
ALU_Q-D 'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B''
ALU_Q-D-1 'ALU/A-B-1,AMX/RAMX,RAMX/Q,BMX/RBMX,RBMX/D''
ALU_Q+K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B''
ALU_Q-K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B''
ALU_Q+K[]+1 'ALU/A+B+1,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@1''
ALU_Q+LB 'RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B''
ALU_Q-LB 'RAMX/Q,AMX/RAMX,BMX/LB,ALU/A-B''
ALU_Q+LB+1 'RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B+1''
ALU_Q+LC 'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B''
ALU_Q-LC 'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B''
ALU_Q+LC+1 'ALU/A+B+1,AMX/RAMX,RAMX/Q,BMX/LC''
ALU_Q+MASK 'ALU/A+B,AMX/RAMX,RAMX/Q,BMX/MASK''
ALU_Q-MASK-1 'ALU/A-B-1,AMX/RAMX,RAMX/Q,BMX/MASK''
ALU_Q.OR.K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR''
ALU_Q.OR.LC 'RAMX/Q,AMX/RAMX,BMX/LC,ALU/OR''
ALU_Q.ORNOT.K[] 'ALU/ORNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@1''
ALU_Q.SXT[] 'ALU/A,AMX/RAMX.SXT,DT/@1,RAMX/Q''
ALU_Q.SXT[].ANDNOT.K[] 'ALU/ANDNOT,AMX/RAMX.SXT,RAMX/Q,BMX/KMX,KMX/@2,DT/@1''
ALU_Q.SXT[]+K[] 'RAMX/Q,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B''
ALU_Q.SXT[]+LB 'RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/LB,ALU/A+B''
ALU_Q.SXT[]+PC 'RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B''
ALU_Q.XOR.D 'RAMX/Q,AMX/RAMX,BMX/RBMX,RBMX/D,ALU/XOR''
ALU_Q.XOR.K[] 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR''
ALU_Q.XOR.LC 'RAMX/Q,AMX/RAMX,BMX/LC,ALU/XOR''
ALU_R[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A''
ALU_R[].AND.K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND''
ALU_R[].ANDNOT.MASK 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/ANDNOT''
ALU_R(DST) 'SPO.AC/LOAD.LAB,SPO.ACN11/DST.DST,AMX/LA,ALU/A''
ALU_R[].OR.K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/OR''
ALU_R[].ORNOT.K[] 'ALU/ORNOT,AMX/LA,BMX/KMX,SPO.R/LOAD.LAB,SPO.RAB/@1,KMX/@2''
ALU_R[].XOR.K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/XOR''
ALU_RC[] 'SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B''
ALU_RC(SC) 'SPO/LOAD.LC.SC,BMX/LC,ALU/B''
ALU_R(SP1)+K[].RLOG 'SPO.AC/LOAD.LAB,SPO.ACN/SP1.SP1,AMX/LA,KMX/@1,BMX/KMX,ALU/A+B.RLOG''

CACHE_DC[] 'VAK/NOP,MCT/WRITE.V.WCHK,DT/@1,DK/NOP''
CACHE[]_D 'VAK/NOP,MCT/WRITE.V.WCHK,MSC/@1,DK/NOP''
CACHE_D.INST.DEP 'VAK/NOP,MCT/WRITE.V.WCHK,DT/INST.DEP,DK/NOP''
CACHE_DC[].NOCHK 'VAK/NOP,MCT/WRITE.V.NOCHK,DT/@1,DK/NOP''
CACHE_P_DC[] 'VAK/NOP,MCT/WRITE.P,DT/@1,DK/NOP''
CACHE_DC[].LK 'VAK/NOP,MCT/LOCKWRITE.V.XCHK,DT/@1,DK/NOP''

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D_DAL.NORM      'DK/DAL.SV''
D_DAL.SC        'DK/DAL.SC''
D_D.OXT[]       'RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,DK/SHF''
D_D.OXT[],ANDNOT,K[] 'RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.OXT[],+K[]  'RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D.OXT[],OR,Q  'RAMX/D,AMX/RAMX.OXT,DT/@1,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.OXT[],+Q    'ALU/A+B,AMX/RAMX.OXT,DT/@1,BMX/RBMX,RBMX/Q,D,ALU''
D_D.OXT[],+Q+1  'RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/RBMX,ALU/A+B+1,D,ALU''
D_D.OXT[],XOR,Q 'DK/SHF,ALU/XOR,SHF/ALU,AMX/RAMX.OXT,RAMX/D,DT/@1,RBMX/Q,BMX/RBMX''
D_D.OXT[],XOR,RC[] 'RAMX/D,AMX/RAMX.OXT,DT/@1,SPO.R/LOAD.LC,SPO.RC/@2,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF''
D_D.AND,K[]     'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND,K[],LEFT2 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DT,DT/LONG,DK/SHF''
D_D.AND,K[],RIGHT 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,DK/SHF''
D_D.AND,LC      'RAMX/D,AMX/RAMX,BMX/LC,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND,MASK    'RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND,Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND,RC[]    'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,DK/SHF''
D_D.ANDNOT,K[]  'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT,LC   'RAMX/D,AMX/RAMX,BMX/LC,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT,PSWZ 'DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.4,SHF/ALU''
D_D.ANDNOT,Q    'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT,RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D(FRAC)       'RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,DK/SHF,FL''
D_D[K[]]        'RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/@1,SHF/ALU,DK/SHF''
D_D+K[]         'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D-K[]         'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF''
D_D+K[]+1       'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B+1,SHF/ALU,DK/SHF''
D_D+LB          'RAMX/D,AMX/RAMX,BMX/LB,ALU/A+B,SHF/ALU,DK/SHF''
D_D+LC          'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,DK/SHF''
D_D-LC          'RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,DK/SHF''
D_D+LC+PSL.C    'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B+PSL.C,SHF/ALU,DK/SHF''
D_D.LEFT        'DK/LEFT''
D_D.LEFT2       'DK/LEFT2''
D_D[]MASK       'RAMX/D,AMX/RAMX,BMX/MASK,ALU/@1,SHF/ALU,DK/SHF''
D_D.OR.ASCII    'D D.OR.K[.30]''
D_D.OR,K[]      'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.ORNOT,MASK  'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,DK/SHF''
D_D.OR,PSWC     'DK/SHF,ALU/OR,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.1,SHF/ALU''
D_D.OR,PSWV     'DK/SHF,ALU/OR,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.2,SHF/ALU''
D_D.OR,Q        'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.OR,RC[]     'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,DK/SHF''
D_D[]Q         'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1,SHF/ALU,DK/SHF''
D_D+Q          'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D-Q          'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF''
D_D+Q+1        'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B+1,SHF/ALU,DK/SHF''
D_D-Q-1        'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B-1,SHF/ALU,DK/SHF''
D_D.RIGHT      'DK/RIGHT''
D_D.RIGHT2     'DK/RIGHT2''
D_D.RIGHT(B)   'RBMX/D,BMX/RBMX,ALU/B,SHF/RIGHT,DK/SHF''
D_D.SWAP       'DK/BYTE.SWAP''
D_D.SXT[]      'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,DK/SHF''
D_D.SXT[],RIGHT 'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/RIGHT,DK/SHF''
D_D.XOR,K[]    'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR,SHF/ALU,DK/SHF''
D_D.XOR,LC     'RAMX/D,AMX/RAMX,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF''
D_D.XOR,Q      'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/XOR,SHF/ALU,DK/SHF''

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D_INT.SUM      'MCT/READ.INT.SUM,DK/NOP''
D_K[]          'KMX/@1,BMX/KMX,ALU/B,SHF/ALU,DK/SHF''
D_K[].RIGHT    'KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT,DK/SHF''
D_K[].RIGHT2   'KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT2,DK/SHF''
D_LA          'AMX/LA,ALU/A,SHF/ALU,DK/SHF''
D_LA.AND.K[]   'AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF''
D_LA+D+PSL.C   'AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B+PSL.C,SHF/ALU,DK/SHF''
D_LA-D         'DK/SHF,ALU/A-B,AMX/LA,BMX/RBMX,RBMX/D,SHF/ALU''
D_LA(FRAC)     'AMX/LA,ALU/A,SHF/ALU,DK/SHF.FL''
D_LA-K[]       'AMX/LA,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF''
D_LA.RIGHT     'AMX/LA,ALU/A,SHF/RIGHT,DK/SHF''
D_LB          'BMX/LB,ALU/B,SHF/ALU,DK/SHF''
D_LB.PC        'BMX/PC.OR.LB,ALU/B,SHF/ALU,DK/SHF''
D_LC          'BMX/LC,ALU/B,SHF/ALU,DK/SHF''
D_LC(FRAC)     'BMX/LC,ALU/B,SHF/ALU,DK/SHF.FL''
D_NOT.D        'RAMX/D,AMX/RAMX,ALU/NOTA,SHF/ALU,DK/SHF''
D_NOT.K[]      'KMX/@1,BMX/KMX,AMX/RAMX.0XT,DT/LONG,ALU/ORNOT,SHF/ALU,DK/SHF''
D_NOT.MASK     'BMX/MASK,AMX/RAMX.0XT,DT/LONG,ALU/ORNOT,SHF/ALU,DK/SHF''
D_NOT.Q        'RAMX/Q,AMX/RAMX,ALU/NOTA,SHF/ALU,DK/SHF''
D_NOT.R[]      'LA_RAC@1],AMX/LA,ALU/NOTA,D_ALU''
D_PACK.FP      'BMX/PACKED.FL,ALU/B,SHF/ALU,DK/SHF''
D_PACK.FP.LEFT 'BMX/PACKED.FL,ALU/B,SHF/LEFT,DK/SHF''
D_PC          'BMX/PC,ALU/B,SHF/ALU,DK/SHF''
D_PC.LEFT     'BMX/PC,ALU/B,SHF/LEFT,DK/SHF''

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D_Q      "DK/Q"
D_Q.OXT[] "RAMX/Q,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,DK/SHF"
D_Q.AND.K[] "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF"
D_Q.AND.LC "RAMX/Q,AMX/RAMX,BMX/LC,ALU/AND,SHF/ALU,DK/SHF"
D_Q.AND.MASK "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,DK/SHF"
D_Q.ANDNOT.D "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.K[] "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.MASK "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.PSWC "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.1,SHF/ALU"
D_Q.ANDNOT.PSWN "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.8,SHF/ALU"
D_Q.ANDNOT.PSWZ "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.4,SHF/ALU"
D_Q.AND.RC[] "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,DK/SHF"
D_Q.D+Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF,QK/SHF"
D_Q+D "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-D "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF"
D_Q-D-1 "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B-1,SHF/ALU,DK/SHF"
D_Q[]D "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/@1,SHF/ALU,DK/SHF"
D_Q(FRAC) "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,DK/SHF.FL"
D_Q+K[] "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-K[] "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF"
D_Q-K[]-1 "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1,SHF/ALU,DK/SHF"
D_Q+LB "RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B,SHF/ALU,DK/SHF"
D_Q[]MASK "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/@1,SHF/ALU,DK/SHF"
D_Q.LEFT "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT,DK/SHF"
D_Q.OR.K[] "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,DK/SHF"
D_Q.ORNOT.MASK "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,DK/SHF"
D_Q.OR.PSWC "DK/SHF,ALU/OR,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.1,SHF/ALU"
D_Q.OR.RC[] "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,DK/SHF"
D_Q+PC "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-PCSV "RAMX/Q,AMX/RAMX,BMX/D,MSC/READ.RLOG,ALU/A-B,SHF/ALU,DK/SHF"
D_Q.RIGHT "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT,DK/SHF"
D_Q.RIGHT2 "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT2,DK/SHF"
D_Q.SXT[] "RAMX/Q,AMX/RAMX,SXT,DT/@1,ALU/A,SHF/ALU,DK/SHF"
D_Q.XOR.RC[] "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF"

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D_RE] "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
 D_RE].AND.K[] "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF"
 D_RE].ORNOT.K[] "LAB_R[@1],AMX/LA,BMX/KMX,KMX/@2,ALU/ORNOT,D,ALU"
 D_RC[] "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,DK/SHF"
 D_RC[] PC "BMX/PC,ALU/B,SHF/ALU,DK/SHF,SPO.R/WRITE.RC,SPO.RC/@1"
 D_RC(SC) "SPO/LOAD.LC.SC,BMX/LC,ALU/B,SHF/ALU,DK/SHF"
 D_RE](FRAC) "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,DK/SHF.FL"
 D_RLOG "BMX/O,MSC/READ.RLOG,ALU/B,SHF/ALU,DK/SHF"
 D_RLOG.RIGHT "BMX/O,MSC/READ.RLOG,ALU/B,SHF/RIGHT,DK/SHF"
 D_R(PRN+1) "SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
 D_R(SC) "SPO.AC/LOAD.LAB,SPO.ACN/SC,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
 D_R(SP1+1) "SPO.AC/LOAD.LAB,SPO.ACN/SP1+1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
 D&VA_ALU "VAK/LOAD,SHF/ALU,DK/SHF"
 D&VA_D-K[] "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,SHF/ALU,DK/SHF"
 D&VA_D+LC "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD,SHF/ALU,DK/SHF"
 D&VA_D+Q "D,D+Q,VAK/LOAD"
 D&VA_LA "AMX/LA,ALU/A,VAK/LOAD,SHF/ALU,DK/SHF"
 D&VA_LB "BMX/LB,ALU/B,VAK/LOAD,SHF/ALU,DK/SHF"
 D&VA_Q "RAMX/Q,AMX/RAMX,ALU/A,VAK/LOAD,DK/Q"
 D&VA_Q+LB.PC "RAMX/Q,AMX/RAMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD,SHF/ALU,DK/SHF"


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EALU_D(EXP)      'RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B'
EALU_FE          'EBMX/FE,EALU/B'
EALU_K[]         'KMX/@1,EBMX/KMX,EALU/B'
EALU_R[] (EXP)   'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,EBMX/AMX.EXP,EALU/B'
EALU_SC          'EALU/A'
EALU_SC.ANDNOT.K[] 'KMX/@1,EBMX/KMX,EALU/ANDNOT'
EALU_SC+FE       'EBMX/FE,EALU/A+B'
EALU_SC-FE       'EBMX/FE,EALU/A-B'
EALU_SC+K[]      'KMX/@1,EBMX/KMX,EALU/A+B'
EALU_SC-K[]      'KMX/@1,EBMX/KMX,EALU/A-B'
EALU_STATE       'EALU/A,MSCL/LOAD.STATE'

FE_O(A)          'AMX/RAMX.OXT,DT/LONG,EBMX/AMX.EXP,EALU/B,FEK/LOAD'
FE_D(EXP)        'RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,FEK/LOAD'
FE_EALU          'FEK/LOAD'
FE_K[]           'KMX/@1,EBMX/KMX,EALU/B,FEK/LOAD'
FE_LA(EXP)       'AMX/LA,EBMX/AMX.EXP,EALU/B,FEK/LOAD'
FE_NABS(SC-LA(EXP)) 'AMX/LA,EBMX/AMX.EXP,EALU/NABS.A-B,FEK/LOAD'
FE_Q(EXP)        'RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,FEK/LOAD'
FE_R[] (EXP)     'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,EBMX/AMX.EXP,EALU/B,FEK/LOAD'
FE_SC            'EALU/A,FEK/LOAD'
FE_SC.ANDNOT.FE  'EBMX/FE,EALU/ANDNOT,FEK/LOAD'
FE_SC.ANDNOT.K[] 'KMX/@1,EBMX/KMX,EALU/ANDNOT,FEK/LOAD'
FE_SC+1          'EALU/A+1,FEK/LOAD'
FE_SC+FE         'EBMX/FE,EALU/A+B,FEK/LOAD'
FE_SC-FE         'EBMX/FE,EALU/A-B,FEK/LOAD'
FE_SC_K[]        'KMX/@1,EBMX/KMX,EALU/B,FEK/LOAD,SMX/EALU,SCK/LOAD'
FE_SC+K[]        'KMX/@1,EBMX/KMX,EALU/A+B,FEK/LOAD'
FE_SC-K[]        'KMX/@1,EBMX/KMX,EALU/A-B,FEK/LOAD'
FE_SC+LA(EXP)    'AMX/LA,EBMX/AMX.EXP,EALU/A+B,FEK/LOAD'
FE_SC-LA(EXP)    'AMX/LA,EBMX/AMX.EXP,EALU/A-B,FEK/LOAD'
FE_SC.OR.K[]     'EALU/OR,EBMX/KMX,KMX/@1,FEK/LOAD'
FE_SC-SHF.VAL    'EBMX/SHF.VAL,EALU/A-B,FEK/LOAD'
FE_SHF.VAL       'EBMX/SHF.VAL,EALU/B,FEK/LOAD'

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ID[]_D      "CID/WRITE.KMX,ID.ADDR/@1"
ID_D&NO.SYNC "CID/WRITE.KMX,ADS/IBA,KMX/SP1.CON"
ID_D.SYNC   "CID/WRITE.KMX,ADS/IBA,KMX/SP1.CON,ACF/SYNC"
ID(SC)_D    "CID/WRITE.SC"

K[]         "KMX/@1"

LA_RAC[]    "SPO.AC/LOAD.LA,SPO.RAB/@1"
LA_R(DST)&LB_R(SRC) "SPO.AC/LOAD.LAB,SPO.ACN11/DST.SRC"
LA_R(SP2)&LB_R(SP1) "SPO.AC/LOAD.LAB,SPO.ACN/SP2.SP1"
LAB_R1&RC[]_O    "ALU_O(A),LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_ALU "SPO.R/LOAD.[AB1.WRITE.RC,SPO.RC/@1,SHF/ALU"
LAB_R1&RC[]_ALU.RIGHT2 "SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,SHF/RIGHT2"
LAB_R1&RC[]_D.OXT[]+K[] "ALU_D.OXT[@2]+K[@3],LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_D+LC    "ALU_D+LC,LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_Q-K[]   "ALU_Q-K[@2],LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_O-D    "SPO.R/LOAD.[AB1.WRITE.RC,SPO.RC/@1,ALU/A-B,AMX/RAMX.OXT,DT/LONG,BMX/RBMX,RBMX/D,SHF/ALU"
LAB_R1&RC[]_O+LC+1 "ALU/A+B+1,AMX/RAMX.OXT,DT/LONG,BMX/LC,SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,SHF/ALU"
LAB_RC[]        "SPO.R/LOAD.LAB,SPO.RAB/@1"
LAB_R(DST)      "SPO.AC/LOAD.LAB,SPO.ACN11/DST.DST"
LAB_R(SC)       "SPO.AC/LOAD.LAB,SPO.ACN/SC"
LAB_R(SP1)      "SPO.AC/LOAD.LAB,SPO.ACN/SP1.SP1"
LC_RC[]         "SPO.R/LOAD.LC,SPO.RC/@1"
LC_RC[]&R1_D    "ALU_D,LC_RC[@1]&R1_ALU"
LC_RC[]&R1_LA-K[] "ALU_LA-K[@2],LC_RC[@1]&R1_ALU"
LC_RC(SC)       "SPO/LOAD.LC.SC"
LC_RC[]&R1_ALU  "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU"
LC_RC[]&R1_(LA+LB).LEFT "AMX/LA,BMX/LB,ALU/A+B,SHF/LEFT,SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1"
LC_RC[]&R1_(LA-LB).LEFT "AMX/LA,BMX/LB,ALU/A-B,SHF/LEFT,SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1"
LC_RC[]&R1_LA+K[] "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU,ALU/A+B,AMX/LA,BMX/KMX,KMX/@2"
LC_RC[]&R1_LB   "ALU_LB,LC_RC[@1]&R1_ALU"
LC_RC[]&R1_Q    "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU,ALU/A,AMX/RAMX,RAMX/Q"

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PC_PC+1      'PCK/PC+1'
PC_PC+2      'PCK/PC+2'
PC_PC+4      'PCK/PC+4'
PC_PC+N      'PCK/PC+N'
PC_Q+PC      'ALU/A+B,VAK/LOAD,PCK/PC_VA,BMX/PC,AMX/RAMX,AMX/Q'
PC_VA        'PCK/PC_VA'
PC&VA_ALU    'VAK/LOAD,PCK/PC_VA'
PC&VA_D      'RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD,PCK/PC_VA'
PC&VA_D.OXT[] 'RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,VAK/LOAD,PCK/PC_VA'
PC&VA_D.OXT[]+PC 'RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA'
PC&VA_D.SXT[]+PC 'RAMX/D,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA'
PC&VA_D+K[]   'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD,PCK/PC_VA'
PC&VA_D-K[]   'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,PCK/PC_VA'
PC&VA_D-PC    'RAMX/D,AMX/RAMX,BMX/PC,ALU/A-B,VAK/LOAD,PCK/PC_VA'
PC&VA_K[]     'KMX/@1,BMX/KMX,ALU/B,VAK/LOAD,PCK/PC_VA'
PC&VA_PC      'BMX/PC,ALU/B,VAK/LOAD,PCK/PC_VA'
PC&VA_Q       'RAMX/Q,AMX/RAMX,ALU/A,VAK/LOAD,PCK/PC_VA'
PC&VA_Q-D     'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,VAK/LOAD,PCK/PC_VA'
PC&VA_Q-K[]   'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,PCK/PC_VA'
PC&VA_Q+PC    'RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA'
PC&VA_Q.SXT[]+PC 'RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA'
PC&VA_R[],ANDNOT,K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/ANDNOT,VAK/LOAD,PCK/PC_VA'
PC&VA_RC[]    'SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,VAK/LOAD,PCK/PC_VA'
PC_VIBA      'PCK/PC_IBA'

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Q_0      'QK/CLR''
Q_0-D    'AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_0-K[]  'AMX/RAMX.OXT,DT/LONG,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_0-LC   'AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF''
Q_0+MASK+1 'AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/ALU,QK/SHF''
Q_0+PC.RLOG 'AMX/RAMX.OXT,DT/LONG,BMX/PC,ALU/A+B.RLOG,SHF/ALU,QK/SHF''
Q_0-Q    'AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_ACCEL&SYNC 'QK/ACCEL,ACF/SYNC''
Q_ALU    'SHF/ALU,QK/SHF''
Q_ALU.LEFT 'SHF/LEFT,QK/SHF''
Q_ALU.LEFT2 'SHF/ALU.DT,DT/LONG,QK/SHF''
Q_ALU.RIGHT 'SHF/RIGHT,QK/SHF''
Q_ALU.RIGHT2 'SHF/RIGHT2,QK/SHF''
Q_ALU(FRAC) 'SHF/ALU,QK/SHF.FL''
Q_D      'QK/D''
Q_D(FRAC)(B) 'RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,QK/SHF.FL''
Q_D.OXT[] 'RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,QK/SHF''
Q_D.OXT[]+K[].LEFT 'RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B,SHF/LEFT,QK/SHF''
Q_D.AND.K[] 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF''
Q_D.AND.K[].RIGHT 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,QK/SHF''
Q_D.AND.K[].RIGHT2 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT2,QK/SHF''
Q_D.ANDNOT.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_D.AND.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,QK/SHF''
Q_DEC.CON 'QK/DEC.CON''
Q_D+K[]  'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF''
Q_D+K[].LEFT 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/LEFT,QK/SHF''
Q_D-K[]  'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_D+LC   'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,QK/SHF''
Q_D-LC   'RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF''
Q_D.LEFT3 'RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT3,QK/SHF''
Q_D.OR.K[] 'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,QK/SHF''
Q_D.OR.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,QK/SHF''
Q_D-Q    'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_D.RIGHT 'RAMX/D,AMX/RAMX,ALU/A,SHF/RIGHT,QK/SHF''
Q_D.RIGHT2 'RAMX/D,AMX/RAMX,ALU/A,SHF/RIGHT2,QK/SHF''
Q_D.SXT[] 'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,QK/SHF''
Q_D.XOR.Q 'QK/SHF,ALU/XOR,AMX/RAMX,RAMX/D,BMX/RBMX,RBMX/Q,SHF/ALU''

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ZZ-ESKAH-V132 Register Transfer Macro Definitions

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Q_IB.BDEST      "IBC/BDEST,QK/ID,MCT/ALLOW.IB.READ"
Q_IB.DATA       "QK/ID,MCT/ALLOW.IB.READ"
Q_ID[]          "CID/READ.KMX,ID,ADDR/@1,QK/ID"
Q_ID(SC)        "CID/READ.SC,QK/ID"
Q_K[]           "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,QK/SHF"
Q_K[].CTX       "KMX/@1,BMX/KMX,ALU/B,SHF/ALU.DT,DT/INST.DEP,QK/SHF"
Q_K[].RIGHT     "KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT,QK/SHF"
Q_K[].RIGHT2    "KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT2,QK/SHF"
Q_LA           "AMX/LA,ALU/A,SHF/ALU,QK/SHF"
Q_LA.AND.K[]    "AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF"
Q_LA.ANDNOT.RC[] "AMX/LA,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_LA+K[]       "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_LA-K[]       "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_LA+Q         "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_LB          "BMX/LB,ALU/B,SHF/ALU,QK/SHF"
Q_LC          "BMX/LC,ALU/B,SHF/ALU,QK/SHF"
Q_NOT.Q        "RAMX/Q,AMX/RAMX,ALU/NOTA,SHF/ALU,QK/SHF"
Q_NOT.R[]      "LA_RA[@1],AMX/LA,ALU/NOTA,Q_ALU"
Q_PACK.FP      "BMX/PAKED.FL,ALU/B,SHF/ALU,QK/SHF"
Q_PC           "BMX/PC,ALU/B,SHF/ALU,QK/SHF"

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ZZ-ESKAH-V132 Register Transfer Macro Definitions

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Q_Q.OXT[]-K[]  'RAMX/Q,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_Q.OXT[].LEFT 'RAMX/Q,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/LEFT,QK/SHF''
Q_Q.OXT[].OR.D  'RAMX/Q,AMX/RAMX.OXT,DT/@1,RBMX/D,BMX/RBMX,ALU/OR,SHF/ALU,QK/SHF''
Q_Q.AND.K[]     'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF''
Q_Q.AND.K[].RIGHT 'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,QK/SHF''
Q_Q.ANDNOT.D    'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_Q.ANDNOT.K[]  'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_Q.ANDNOT.RC[] 'RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_Q.AND.RC[]    'RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,QK/SHF''
Q_Q-D          'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_Q+D          'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,QK/SHF''
Q_Q-D-1        'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B-1,SHF/ALU,QK/SHF''
Q_Q(FRAC)      'RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,QK/SHF.FL''
Q_Q(FRAC)(B)   'RBMX/Q,BMX/RBMX,ALU/B,SHF/ALU,QK/SHF.FL''
Q_Q+K[]        'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF''
Q_Q-K[]        'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF''
Q_Q-K[]-1      'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1,SHF/ALU,QK/SHF''
Q_Q+LC         'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,QK/SHF''
Q_Q-LC        'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF''
Q_Q-LC-1      'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B-1,SHF/ALU,QK/SHF''
Q_Q.LEFT      'QK/LEFT''
Q_Q-MASK-1    'RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A-B-1,SHF/ALU,QK/SHF''
Q_Q.OR.K[]    'RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,QK/SHF''
Q_Q.ORNOT.MASK 'RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,QK/SHF''
Q_Q+PC       'RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,QK/SHF''
Q_Q.RIGHT    'QK/RIGHT''
Q_Q.RIGHT2   'QK/RIGHT2''
Q_Q.SXT[]    'RAMX/Q,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,QK/SHF''
Q_R[]        'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,QK/SHF''
Q_R[].AND.K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF''
Q_R[].AND.K[].RIGHT 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/AND,BMX/KMX,KMX/@2,SHF/RIGHT,QK/SHF''
Q_R[].ANDNOT.K[] 'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_RC[]       'SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,QK/SHF''
Q_RC[(FRAC)] 'SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,QK/SHF.FL''
Q_R[(FRAC)]  'SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,QK/SHF.FL''
Q_R(PRN).ANDNOT.Q 'SPO.AC/LOAD.LAB,SPO.ACN/PRN,AMX/LA,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,QK/SHF''
Q_R(PRN+1)    'SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,ALU/A,SHF/ALU,QK/SHF''
Q_R(PRN+1).AND.Q 'SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,RBMX/Q,BMX/RBMX,ALU/AND,SHF/ALU,QK/SHF''
Q_R(SRC!1).AND.K[] 'SPO.AC/LOAD.LAB,SPO.ACN11/SRC.OR.1,AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF''
Q_SC         'ALU/B,BMX/KMX,KMX/SC,SHF/ALU,QK/SHF''
Q&VA_ALU     'VAK/LOAD,SHF/ALU,QK/SHF''
Q&VA_D       'RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD,SHF/ALU,QK/SHF''
Q&VA_D+LC    'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD,SHF/ALU,QK/SHF''
Q&VA_LA      'AMX/LA,ALU/A,VAK/LOAD,SHF/ALU,QK/SHF''
Q&VA_Q+LB.PC 'RAMX/Q,AMX/RAMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD,SHF/ALU,QK/SHF''

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R[]_0      "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX.OXT,DT/LONG,ALU/A,SHF/ALU"
R[]_0-D    "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-K[]  "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-LB   "AMX/RAMX.OXT,DT/LONG,BMX/LB,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-LB+1 "AMX/RAMX.OXT,DT/LONG,BMX/LB,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-Q    "AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-1    "AMX/RAMX.OXT,DT/LONG,BMX/KMX,KMX/.1,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_ALU    "SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_ALU.LEFT "SPO.R/WRITE.RAB,SPO.RAB/@1,SHF/LEFT"
R[]_ALU.RIGHT "SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_D      "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,ALU/A,SHF/ALU"
R[]_D.AND.K[] "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/AND,AMX/RAMX,AMX/D,BMX/KMX,KMX/@2,SHF/ALU"
R[]_D+K[]  "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/KMX,KMX/@2,BMX/KMX,ALU/A+B,SHF/ALU"
R[]_D-K[]  "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/KMX,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU"
R6_D+K[].RLOG "SPO.R/WRITE.RAB,SPO.RAB/R6,AMX/RAMX,AMX/D,BMX/KMX,KMX/@1,BMX/KMX,ALU/A+B.RLOG,SHF/ALU"
R[]_D-LC-1 "ALU/D-LC-1,R[@1]_ALU"
R[]_D.OR.LC "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,AMX/D,BMX/LC,SHF/ALU"
R[]_D.OR.PACK.FP "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,AMX/D,BMX/PAKED.FL,SHF/ALU"
R[]_D.OR.Q "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/Q,BMX/RBMX,ALU/OR,SHF/ALU"
R[]_D+Q    "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU"
R[]_D-Q    "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU"
R[]_D+Q+1  "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/D,BMX/Q,BMX/RBMX,ALU/A+B+1,SHF/ALU"
R[]_K[]    "BMX/KMX,KMX/@2,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA     "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU"
R[]_LA.AND.K[] "AMX/LA,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+D   "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+D+1 "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-D   "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[] "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[]+1 "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B+1,R[@1]_ALU"
R[]_LA-K[] "AMX/LA,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[].RLOG "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-K[].RLOG "AMX/LA,BMX/KMX,KMX/@2,ALU/A-B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R6_LA+K[].RLOG "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B.RLOG,DT/WORD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/R6"
R6_LA-K[].RLOG "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B.RLOG,DT/WORD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/R6"
R[]_LA+LC  "AMX/LA,BMX/LC,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+MASK+1 "AMX/LA,BMX/MASK,ALU/A+B+1,R[@1]_ALU"
R[]_LA-MASK-1 "ALU/A-B-1,AMX/LA,BMX/MASK,SPO.R/WRITE.RAB,SPO.RAB/@1,SHF/ALU"
R[]_LA.OR.D "AMX/LA,RBMX/D,BMX/RBMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA.ORNOT.MASK "AMX/LA,BMX/MASK,ALU/ORNOT,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+Q   "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-Q   "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LB     "BMX/LB,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LC     "BMX/LC,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LC.RIGHT "BMX/LC,ALU/B,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_NOT.0  "AMX/RAMX.OXT,DT/LONG,ALU/NOT,R[@1]_ALU"
R[]_NOT.D  "AMX/RAMX.OXT,DT/LONG,ALU/NOT,R[@1]_ALU"
R[]_NOT.MASK "BMX/MASK,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_NOT.Q  "AMX/RAMX.OXT,DT/LONG,ALU/NOT,R[@1]_ALU"
R[]_PACK.FP "BMX/PAKED.FL,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"

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 R[]_Q "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,ALU/A,SHF/ALU"
 R[]_Q+1 "ALU_Q+Q+1,R[@1],ALU"
 R[]_Q+5 "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A+5,BMX/KMX,KMX/.4,AMX/RAMX,AMX/Q,SHF/ALU"
 R[]_Q-D "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU"
 R[]_Q-D-1 "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A-B-1,AMX/RAMX,AMX/Q,BMX/RBMX,RBMX/D,SHF/ALU"
 R[]_Q+K[] "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU"
 R[]_Q-K[] "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU"
 R[]_Q-K[].RLOG "AMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
 R[]_Q+LB "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A+B,AMX/RAMX,BMX/LB,AMX/Q,SHF/ALU"
 R[]_Q+LC "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU"
 R[]_Q-LC "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU"
 R[]_Q.AND.K[] "ALU/AND,SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,AMX/Q,BMX/KMX,KMX/@2"
 R[]_Q.ANDNOT.K[] "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/ANDNOT,AMX/RAMX,AMX/Q,BMX/KMX,KMX/@2,SHF/ALU"
 R[]_Q.OR.D "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,AMX/Q,BMX/RBMX,RBMX/D,SHF/ALU"
 R[]_Q.ORNOT.K[] "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/ORNOT,SHF/ALU"
 R[]_Q.RIGHT.1 "ALU_Q,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"
 R[]_RLOG.RIGHT.1 "BMX/Q,MSC/READ.RLOG,ALU/B,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"

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RC[]_0      "AMX/RAMX.OXT,DT/LONG,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0-D    "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+K[]+1 "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+LC+1  "AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+MASK+1 "AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+MASK+1.RIGHT2 "AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/RIGHT2,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU     "SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU.LEFT "SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU.LEFT2 "SPO.R/WRITE.RC,SPO.RC/@1,SHF/ALU,DT,DT/LONG"
RC[]_ALU.LEFT3 "SPO.R/WRITE.RC,SPO.RC/@1,SHF/LEFT3"
RC[]_ALU.RIGHT "SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D       "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OXT[] "RAMX/D,AMX/RAMX.OXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.AND.K[] "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.AND.MASK "RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.ANDNOT.Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D(B)     "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.CTX    "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,DT,DT/INST.DEP,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D+K[]    "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D-K[]    "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.LEFT   "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.LEFT3  "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT3,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OR.K[] "RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OR.Q   "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.ORNOT.K[] "SPO.RC/@1,SPO.R/WRITE.RC,ALU/ORNOT,AMX/RAMX,RAMX/D,BMX/KMX,KMX/@2,SHF/ALU"
RC[]_D.SXT[]  "RAMX/D,AMX/RAMX.SXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"

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RC[]_K[]      "KMX/@2,BMX/KMX,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[]+1    "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[]_LEFT2 "KMX/@2,BMX/KMX,ALU/B,SHF/ALU.DT,DT/LONG,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[]_RIGHT2 "KMX/@2,BMX/KMX,ALU/B,SHF/RIGHT2,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA      "AMX/LA,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA.AND.K[] "ALU LA.AND.K[@2],RC[@1]_ALU"
RC[]_LA.CTX  "AMX/LA,ALU/A,SHF/ALU.DT,DT/INST.DEP,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA-K[]  "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LB      "BMX/LB,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LB.LEFT "BMX/LB,ALU/B,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LC      "BMX/LC,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_NOT.Q   "RAMX/Q,AMX/RAMX,ALU/NOTA,RC[@1]_ALU"
RC[]_PACK.FP "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_PC      "BMX/PC,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q       "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.OXT[] "RAMX/Q,AMX/RAMX.OXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.AND.K[] "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.ANDNOT.K[] "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/ANDNOT,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+1     "ALU 0+Q+1,RC[@1]_ALU"
RC[]_Q+K[]   "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q-K[]   "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.LEFT  "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.LEFT3 "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT3,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q-MASK-1 "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A-B-1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+PC    "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+PC+1  "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.RIGHT "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.SXT[] "RAMX/Q,AMX/RAMX.SXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_RLOG.RIGHT "BMX/O,MSC/READ.RLOG,ALU/B,SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_VAK.D+Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC(SC)_ALU   "SHF/ALU,SPO/WRITE.RC.SC"

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R(DST)_ALU      "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(DST)_D        "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(DST)_D.SXT[]_RIGHT "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/RIGHT,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(PRN)_ALU      "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_D        "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_D.OR.Q   "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,R(PRN)_ALU"
R(PRN)_D[]Q     "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1,R(PRN)_ALU"
R(PRN)_D+K[]_RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_D-K[]_RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_K[]      "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_LA+K[]_RLOG "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B,RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_LA-K[]_RLOG "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B,RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_LA[]MASK "AMX/LA,BMX/MASK,ALU/@1,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_LA+Q     "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_PACK.FP "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_Q        "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN+1)_D      "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_D.OR.Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_LC     "BMX/LC,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_Q      "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(SC)_ALU      "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_D        "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LA+D     "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LA-D     "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LC      "ALU/LC,R(SC)_ALU"
R(SC)_Q        "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SP1+1)_LC    "BMX/LC,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1+1"
R(SP1+1)_Q     "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1+1"
R(SP1)_ALU     "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_D      "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_K[]    "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_PACK.FP "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_Q      "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SRC)_ALU     "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D      "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D(B)   "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D+K[]_RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,RLOG,DT/WORD,R(SRC)_ALU"
R(SRC)_D-K[]_RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,RLOG,DT/WORD,R(SRC)_ALU"
R(SRC)_LC     "BMX/LC,ALU/B,R(SRC)_ALU"
R(SRC)_Q      "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC!T)_ALU  "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.OR.1"
R(SRC!1)_D(B) "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.OR.1"
R[]&VA_LA+K[] "AMX/LA,KMX/@2,BMX/KMX,ALU/A+B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_LA-K[] "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_LA-K[]_RLOG "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B,RLOG,DT/LONG,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_Q-K[]  "RAMX/Q,AMX/RAMX,KMX/@2,BMX/KMX,ALU/A-B,VAK/LOAD,SPO.R/WRITE.RAB,SPO.RAB/@1"

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ZZ-ESKAM-V132 Register Transfer Macro Definitions

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SC_O(A)          "AMX/RAMX.OXT,DT/LONG,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_O-K[]         "BMX/KMX,KMX/@1,AMX/RAMX.OXT,DT/LONG,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_ALU           "SMX/ALU,SCK/LOAD"
SC_ALU(EXP)      "SMX/ALU.EXP,SCK/LOAD"
SC_D             "RAMX/D,AMX/RAMX,ALU/A,SMX/ALU,SCK/LOAD"
SC_D.OXT[]-K[]   "RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_D.OXT[],XOR.K[] "RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/KMX,KMX/@2,ALU/XOR,SC_ALU"
SC_D.AND.K[]     "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SMX/ALU,SCK/LOAD"
SC_D(EXP)        "RAMX/D,AMX/RAMX,ALU/A,SMX/ALU.EXP,SCK/LOAD"
SC_D(EXP)(A)     "RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_D(EXP)(B)     "RBMX/D,BMX/RBMX,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_D-K[]         "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_D.OR.K[]      "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SMX/ALU,SCK/LOAD"
SC_D.SXT[]       "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SMX/ALU,SCK/LOAD"
SC_EALU          "SMX/EALU,SCK/LOAD"
SC_FE           "SMX/FE,SCK/LOAD"
SC_NABS(SC-FE)   "EBMX/FE,EALU/NABS.A-B,SMX/EALU,SCK/LOAD"
SC_K[]          "KMX/@1,EBMX/KMX,EALU/B,SMX/EALU,SCK/LOAD"
SC_K[],ALU       "KMX/@1,BMX/KMX,ALU/B,SMX/ALU,SCK/LOAD"
SC_LA           "AMX/LA,ALU/A,SMX/ALU,SCK/LOAD"
SC_LA.AND.K[]   "AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SMX/ALU,SCK/LOAD"
SC_LC(EXP)      "BMX/LC,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_PSLADDR      "SMX/EALU,EBMX/KMX,SCK/LOAD,KMX/.F,EALU/B"
SC_Q            "RAMX/Q,AMX/RAMX,ALU/A,SMX/ALU,SCK/LOAD"
SC_Q.AND.K[]    "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/AND,SMX/ALU,SCK/LOAD"
SC_Q(EXP)       "RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_Q(EXP)(B)    "RBMX/Q,BMX/RBMX,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_Q+K[]        "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/A+B,SMX/ALU,SCK/LOAD"
SC_Q-K[]        "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_Q.OR.K[]     "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/OR,SMX/ALU,SCK/LOAD"
SC_Q.SXT[]      "RAMX/Q,AMX/RAMX.SXT,DT/@1,ALU/A,SMX/ALU,SCK/LOAD"
SC_R[]          "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SMX/ALU,SCK/LOAD"
SC_RC[]         "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SMX/ALU,SCK/LOAD"
SC_R[],AND.K[]  "ALU/AND,AMX/LA,SPO.R/LOAD.LAB,SPO.RAB/@1,BMX/KMX,KMX/@2,SMX/ALU,SCK/LOAD"
SC_R[],EXP      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SMX/ALU.EXP,SCK/LOAD"
SC_R[],EXP      "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_SC+1         "EALU/A+1,SMX/EALU,SCK/LOAD"
SC_SC.ANDNOT.FE "EBMX/FE,EALU/ANDNOT,SMX/EALU,SCK/LOAD"
SC_SC.ANDNOT.K[] "KMX/@1,EBMX/KMX,EALU/ANDNOT,SMX/EALU,SCK/LOAD"
SC_SC+FE        "EBMX/FE,EALU/A+B,SMX/EALU,SCK/LOAD"
SC_SC-FE        "EBMX/FE,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SC+K[]       "KMX/@1,EBMX/KMX,EALU/A+B,SMX/EALU,SCK/LOAD"
SC_SC-K[]       "KMX/@1,EBMX/KMX,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SC.OR.K[]    "KMX/@1,EBMX/KMX,EALU/OR,SMX/EALU,SCK/LOAD"
SC_SC-SHF.VAL   "EBMX/SHF.VAL,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SHF.VAL      "EBMX/SHF.VAL,EALU/B,SMX/EALU,SCK/LOAD"
SC_STATE        "EALU/A,MSC/LOAD.STATE,SMX/EALU,SCK/LOAD"
SC_STATE.ANDNOT.K[] "EALU/ANDNOT,EBMX/KMX,MSC/LOAD.STATE,SMX/EALU,SCK/LOAD,KMX/@1"
SC_STATE_STATE-R[] (EXP) "LAB_R[@1],AMX/LA,EBMX/AMX.EXP,MSC/LOAD.STATE,EALU/A-B,SMX/EALU,SCK/LOAD"

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SD_NOT.SD      ''SGN/NOT.SD''
SD_SS          ''SGN/SD.FROM.SS''
SS_0&SD_0      ''SGN/CLR.SD+SS''
SS_ALU15       ''SGN/LOAD.SS''
SS_SD          ''SGN/SS.FROM.SD''
SS_SS.XOR.ALU15&SD_ALU15 ''SGN/SS.XOR.ALU''

STATE_O(A)      ''AMX/RAMX.OXT,DT/LONG,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE''
STATE_AMX.EXP    ''EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE''
STATE_D(EXP)     ''RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE''
STATE_FE         ''EBMX/FE,EALU/B,MSC/LOAD.STATE''
STATE_K[]        ''KMX/@1,EBMX/KMX,EALU/B,MSC/LOAD.STATE''
STATE_Q(EXP)     ''RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE''
STATE_SC.VIA.KMX ''MSC/LOAD.STATE,EALU/B,EBMX/KMX,KMX/SC''
STATE_STATE+1    ''EALU/A+1,MSC/LOAD.STATE''
STATE_STATE.ANDNOT.FE ''EBMX/FE,EALU/ANDNOT,MSC/LOAD.STATE''
STATE_STATE.ANDNOT.K[] ''KMX/@1,EBMX/KMX,EALU/ANDNOT,MSC/LOAD.STATE''
STATE_STATE+FE    ''EBMX/FE,EALU/A+B,MSC/LOAD.STATE''
STATE_STATE-FE    ''EBMX/FE,EALU/A-B,MSC/LOAD.STATE''
STATE_STATE+K[]   ''KMX/@1,EBMX/KMX,EALU/A+B,MSC/LOAD.STATE''
STATE_STATE-K[]   ''KMX/@1,EBMX/KMX,EALU/A-B,MSC/LOAD.STATE''
STATE_STATE.OR.FE ''EALU/OR,EBMX/FE,MSC/LOAD.STATE''
STATE_STATE.OR.K[] ''KMX/@1,EBMX/KMX,EALU/OR,MSC/LOAD.STATE''
;SKPC STATES
STATE_SKPLONG     ''STATE_K[.4]''
STATE_STATE.AN.SKPLONG ''STATE_STATE.ANDNOT.K[.4]''
;EDITPC STATES
STATE_FIRST       ''STATE_K[ZERO]''
STATE_PREDEC      ''STATE_K[.80]''
STATE_STATE.AN.5TO0 ''STATE_STATE.ANDNOT.K[.3F]''
STATE_STATE.AN.6TO4 ''STATE_STATE.ANDNOT.K[.7F]''
STATE_STATE.AN.DESTDBL ''STATE_STATE.ANDNOT.K[.6]''
STATE_STATE.AN.NOTPREDEC ''STATE_STATE.ANDNOT.K[.7F]''
STATE_STATE.AN.PREDECZERO ''STATE_STATE.ANDNOT.K[.C0]''
STATE_STATE.OR.ADJINP ''STATE_STATE.OR.K[.3]''
STATE_STATE.OR.DEST ''STATE_STATE.OR.K[.4]''
STATE_STATE.OR.DESTDBL ''STATE_STATE.OR.K[.6]''
STATE_STATE.OR.FILL ''STATE_STATE.OR.K[.7]''
STATE_STATE.OR.FLOAT ''STATE_STATE.OR.K[.60]''
STATE_STATE.OR.MOVE ''STATE_STATE.OR.K[.50]''
STATE_STATE.OR.PATT1 ''STATE_STATE.OR.K[.1]''
STATE_STATE.OR.PATT2 ''STATE_STATE.OR.K[.2]''
;MATCHC STATES
STATE_INNEROBJ     ''STATE_K[.1]''
STATE_INNERSRC     ''STATE_K[.3]''
STATE_OUTER        ''STATE_K[ZERO]''

SWAPD             ''DK/BYTE.SWAP''

VA_ALU            ''VAK/LOAD''
VA_D              ''RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD''
VA_D.OXT[]+Q      ''RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/RBMX,ALU/A+B,VAK/LOAD''
VA_D.ANDNOT.K[]   ''RAMX/D,AMX/RAMX,BMX/KMX,KMX/@1,ALU/ANDNOT,VAK/LOAD''
VA_D+K[]          ''RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD''
VA_D+LC           ''RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD''
VA_D+Q            ''RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD''
VA_K[]            ''KMX/@1,BMX/KMX,ALU/B,VAK/LOAD''
VA_LA             ''AMX/LA,ALU/A,VAK/LOAD''

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ZZ-ESKAH-V132 Register Transfer Macro Definitions

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VA_LA.AND.LC      "AMX/LA,BMX/LC,ALU/AND,VAK/LOAD"
VA_LA.ANDNOT.K[]  "AMX/LA,BMX/KMX,KMX/@1,ALU/ANDNOT,VAK/LOAD"
VA_LA+D           "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_LA-D           "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,VAK/LOAD"
VA_LA+K[]         "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B,VAK/LOAD"
VA_LA-K[]         "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B,VAK/LOAD"
VA_LA+K[]+1       "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B+1,VAK/LOAD"
VA_LA-K[]-1       "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B-1,VAK/LOAD"
VA_LA+PC          "AMX/LA,BMX/PC,ALU/A+B,VAK/LOAD"
VA_LA+Q           "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_LA-Q           "VAK/LOAD,ALU/A-B,AMX/LA,BMX/RBMX,RBMX/Q,SHF/ALU"
VA_LB+D.OXT       "BMX/LB,ALU/A+B,AMX/RMX.OXT,DT/BYTE,VAK/LOAD"
VA_PC             "BMX/PC,ALU/B,VAK/LOAD"
VA_Q              "RAMX/Q,AMX/RMX,ALU/A,VAK/LOAD"
VA_Q.ANDNOT.K[]   "RAMX/Q,AMX/RMX,KMX/@1,BMX/KMX,ALU/ANDNOT,VAK/LOAD"
VA_Q+D            "VAK/LOAD,ALU/A+B,AMX/RMX,BMX/RBMX,RMX/Q,RBMX/D,SHF/ALU"
VA_Q+K[]          "RAMX/Q,AMX/RMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD"
VA_Q-K[]          "RAMX/Q,AMX/RMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD"
VA_Q+LC           "RAMX/Q,AMX/RMX,BMX/LC,ALU/A+B,VAK/LOAD"
VA_Q+LB           "RAMX/Q,AMX/RMX,BMX/LB,ALU/A+B,VAK/LOAD"
VA_Q-LB           "RAMX/Q,AMX/RMX,BMX/LB,ALU/A-B,VAK/LOAD"
VA_Q+LB.PC        "RAMX/Q,AMX/RMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD"
VA_Q+PC           "RAMX/Q,AMX/RMX,BMX/PC,ALU/A+B,VAK/LOAD"
VA_R[]            "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,VAK/LOAD"
VA_RC[]           "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,VAK/LOAD"
VA_VA+4           "PCK/VA+4"

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ZZ-ESKAH-V132 Non-transfer Functions

B.FORK	"LAB R(SP1),QK/ID,CLR.IB.COND,PC_PC+N,SUB/SPEC,J/B.FORK"	
BYTE	"DT/BYTE"	
CACHE.INVALIDATE	"MCT/INVALIDATE,VAK/NOP"	
CALL	"SUB/CALL"	
CALL[]	"CALL,J/@1"	
C.FORK	"SUB/SPEC,J/C.FORK"	
CHK.ODD.ADDR	"MSC/CHK.ODD.ADDR"	
CHK.FLT.OPR	"MSC/CHK.FLT.OPR"	
CLK.UBCC	"CCK/LOAD.UBCC"	
CLR.FPD	"MSC/CLR.FPD"	
CLR.IB0-1	"IBC/CLR.0.1,IEK/ISTR"	
CLR.IB0-3	"IBC/CLR.0-3"	:DISCARD -11 INSTR & OPERAND
CLR.IB2-3	"IBC/CLR.2.3"	:11 MODE DISCARD ISTREAM OPERAND
CLR.IB2-5	"IBC/CLR.1-5.COND"	:2ND PART OF Q/D IMMEDIATE
CLR.IB.COND	"IBC/CLR.1-5.COND"	
CLR.IB.OPC	"IBC/CLR.0,IEK/ISTR"	
CLR.IB.SPEC	"IBC/CLR.1"	
CLR.NEST.ERR	"MSC/CLR.NEST.ERR"	
CLR.SD&SS	"SGN/CLR.SD+SS"	
EXCEPT.ACK	"IEK/EACK"	
FLUSH.IB	"IBC/FLUSH,VAK/LOAD,IEK/ISTR"	
INHIBIT.IB	"MCT/MEM.NOP"	
INTRPT.ACK	"IEK/IACK"	
INTRPT.STROBE	"IEK/ISTR"	
IRD	"IRDO,CLK.UBCC,IRD1,SUB/SPEC,J/A.FORK"	
IRDO	"LA R(SP2)&LB R(SP1),D&VA LB,SC ALU(EXP),FE LA(EXP),SS ALU15"	
IRD1	"MSC/IRD,QK/ID,MCT/ALLOW.IB.READ,IBC/CLR.1-5.COND,PCK/PC+N"	
IRD.11	"LA R(DST)&LB R(SRC),D LB.PC,VAK/LOAD,Q_IB.DATA,SC_K[.10],PCK/PC+N,MSC/IRD,SUB/SPEC,J/DPO"	
LOAD.IB	"VAK/NOP,MCT/READ.V.NEWPC"	
LOAD.IB.11	"VAK/NOP,MCT/READ.V.NEWPC"	
LONG	"DT/LONG"	
POLY.DONE	"ACF/CONTROL,ACM/POLY.DONE"	

ZZ-ESKAH-V132	Non-transfer Functions
RETURN0	"SUB/RET,J/0"
RETURN1	"SUB/RET,J/1"
RETURN2	"SUB/RET,J/2"
RETURN3	"SUB/RET,J/3"
RETURN8	"SUB/RET,J/8"
RETURN9	"SUB/RET,J/9"
RETURNF	"SUB/RET,J/0F"
RETURN10	"SUB/RET,J/10"
RETURN12	"SUB/RET,J/12"
RETURN18	"SUB/RET,J/18"
RETURN1F	"SUB/RET,J/1F"
RETURN20	"SUB/RET,J/20"
RETURN24	"SUB/RET,J/24"
RETURN40	"SUB/RET,J/40"
RETURN60	"SUB/RET,J/60"
RETURN61	"SUB/RET,J/61"
RETURN100	"SUB/RET,J/100"
RETURN10C	"SUB/RET,J/10C"
RETURN10E	"SUB/RET,J/10E"
SET.CC(INST)	"CCK/INST.DEP,DT/INST.DEP"
SET.CC(LONG)	"CCK/INST.DEP,DT/LONG"
SET.CC(ROR)	"CCK/ROR"
SET.FPD	"MSC/SET.FPD"
SET.N.AND.Z	"CCK/TST.Z"
SET.NEST.ERR	"MSC/SET.NEST.ERR"
SET.N&Z	"CCK/N+Z.ALU"
SET.PSL.C(AMX)	"CCK/C.AMX0"
SET.V	"CCK/SET.V"
START.IB	"IBC/START"
STOP.IB	"IBC/STOP"
TEST.TB.RCHK	"MCT/TEST.RCHK,VAK/NOP"
TEST.TB.WCHK	"MCT/TEST.WCHK,VAK/NOP"
TRAP.ACC[]	"ACF/TRAP.ACM/@1"
WORD	"DT/WORD"
WRITE.DEST	"LAB_R(SP1),OK/ID,CLR.IB.COND,PC_PC+N,SUB/SPEC,J/WRD"

Z2-ESKAH-V132 Branch Enable Macro Definitions

ACCEL?	'BEN/ACCEL''	
ACC.SYNC?	'BEN/ACCEL''	::J3/3''
AC.LOW?	'BEN/INTERRUPT''	::J3/3''
ALIGNED?	'BEN/TB.TEST''	::J5/17''
ALU?	'BEN/ALU''	
ALU.N?	'BEN/ALU''	::J4/07''
ALU1-0?	'BEN/ALU1-0''	
BCDSGN?	'BEN/DECIMAL''	::J2/2''
C31?	'BEN/C31''	
CONSOLE.MODE?	'BEN/PSL.MODE''	::J5/18''
DO?	'BEN/D3-0''	::J4/0E''
D(1)?	'BEN/MUL''	
D2?	'BEN/D3-0''	::J4/0B''
D2-0?	'BEN/D3-0''	::J4/08''
D3?	'BEN/D3-0''	::J4/07''
D3-0?	'BEN/D3-0''	
D31?	'BEN/SIGNS''	::J3/6''
DATA.TYPE?	'BEN/DATA.TYPE''	
D.B0?	'BEN/D.BYTES''	::J4/0E''
D.B1?	'BEN/D.BYTES''	::J4/0D''
D.B2?	'BEN/D.BYTES''	::J4/0B''
DBL?	'BEN/DATA.TYPE''	
D.BYTES?	'BEN/D.BYTES''	
D.NE.0?	'BEN/SIGNS''	::J3/5'' ;PREFERED FORM
EALU?	'BEN/EALU''	
EALU.N?	'BEN/EALU''	::J4/07''
EALU.Z?	'BEN/EALU''	::J4/0B''
END.DP1?	'BEN/END.DP1''	
FPD?	'BEN/LAST.REF''	::J4/07''

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ZZ-ESKAH-V132 Branch Enable Macro Definitions
INT? 'BEN/INTERRUPT'
!INTERRUPT.REQ? 'BEN/INTERRUPT' ;J3/5'
IRO? 'BEN/ALU' ;J4/0D'
IRO.C31? 'BEN/ALU'
IR1? 'BEN/IR2-1' ;J3/6'
IR2-1? 'BEN/IR2-1'
LAST.REF? 'BEN/LAST.REF'
MODE.LSS.ASTLVL? 'BEN/REI' ;J3/3'
MUL? 'BEN/MUL'
NEST.ERR? 'BEN/LAST.REF' ;J4/0B'
PC.MODES? 'BEN/PC.MODES'
PSL.C? 'BEN/PSL.CC' ;J4/0E'
PSL.CC? 'BEN/PSL.CC'
PSL.MODE? 'BEN/PSL.MODE'
PSL.N? 'BEN/PSL.CC' ;J4/7'
PSL.V? 'BEN/PSL.CC' ;J4/0D'
PSL.Z? 'BEN/PSL.CC' ;J4/0B'
PTE.VALID? 'BEN/TB.TEST' ;J5/0F'
QUAD? 'BEN/DATA.TYPE'
Q31? 'BEN/SIGNS' ;J3/3'
RLOG.EMPTY? 'BEN/ALU1-0' ;J4/7'
ROR? 'BEN/ROR'
SC? 'BEN/SC'
SC.GT.0? 'BEN/SC'
SC.NE.0? 'BEN/MUL' ;J3/3'
SIGNS? 'BEN/SIGNS'
SRC.PC? 'BEN/SRC.PC' ;COMP MODE, BEN ON SRC R = PC
SS? 'BEN/EALU' ;J4/0E'
STATE0? 'BEN/STATE3-0' ;J4/0E'
STATE1? 'BEN/STATE3-0' ;J4/0D'
STATE1-0? 'BEN/STATE3-0' ;J4/0C'
STATE2? 'BEN/STATE3-0' ;J4/0B'
STATE3? 'BEN/STATE3-0' ;J4/07'
STATE3-0? 'BEN/STATE3-0'
STATE4? 'BEN/STATE7-4'
STATE5? 'BEN/STATE7-4'
STATE6? 'BEN/STATE7-4'
STATE(7)? 'STATE7-4?'
STATE7-4? 'BEN/STATE7-4'
TB.TEST? 'BEN/TB.TEST'
VA31? 'BEN/PSL.MODE' ;J5/0F'
VA31-30? 'BEN/PSL.MODE' ;J5/07'
Z? 'BEN/Z'
ZONED? 'BEN/DECIMAL' ;J2/1'

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.BIN

;MAKE LISTING ROOM FOR BINARY FROM HERE ON

ZZ-ESKAH-V132 MICRO DIAGNOSTIC DEFINED MACROS

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ALEG_D      "AMX/RAMX, RAMX/D"
ALEG_LA     "AMX/LA"
ALEG_LAB    "AMX/LA"
ALEG_Q      "AMX/RAMX, RAMX/Q"
ALU_Q(K)    "KMX/ZERO, BMX/KMX, ALU/B"
ALU_Q+D+1   "AMX/RAMX, OXT, DT/LONG, RBMX/D, BMX/RBMX, ALU/A+B+1"
ALU_D.AND.Q "RAMX/D, AMX/RAMX, RBMX/Q, BMX/RBMX, ALU/AND"
ALU_D.OR.MASK "RAMX/D, AMX/RAMX, BMX/MASK, ALU/OR"
ALU_D[]LB   "RAMX/D, AMX/RAMX, BMX/LB, ALU/@1"
ALU_D[]MASK "RAMX/D, AMX/RAMX, BMX/MASK, ALU/@1"
ALU_D[]RC[] "AMX/RAMX, RAMX/D, LC RC[02], BMX/LC, ALU/@1"
ALU_D[]RC(SC) "SPO/LOAD, LC, SC, BMX/LC, AMX/RAMX, RAMX/D, ALU/@1"
ALU_D[]RC[] "AMX/RAMX, RAMX/D, LAB_R[02], BMX/LB, ALU/@1"
ALU_D-RC[]  "BMX/RBMX, RBMX/D, LAB_R[01], AMX/LA, ALU/A-B"
ALU_LA-LC   "AMX/LA, BMX/LC, ALU/A-B"
ALU_LA.AND.LC "AMX/LA, BMX/LC, ALU/AND"
ALU_LA[]K[] "AMX/LA, BMX/KMX, KMX/@2, ALU/@1"
ALU_LA[]LC   "AMX/LA, BMX/LC, ALU/@1"
ALU_LA.XOR.RC[] "SPO.R/LOAD, LC, SPO.RC/@1, AMX/LA, BMX/LC, ALU/XOR"
ALU_MASK    "BMX/MASK, ALU/B"
ALU_MASK+1  "AMX/RAMX, OXT, DT/LONG, BMX/MASK, ALU/A+B+1"
ALU_NOT.K[] "AMX/RAMX, OXT, DT/LONG, KMX/@1, BMX/KMX, ALU/ORNOT"
ALU_NOT.LA  "AMX/LA, ALU/NOTA"
ALU_NOT.MASK "AMX/RAMX, OXT, DT/LONG, BMX/MASK, ALU/ORNOT"
ALU_NOT.Q   "RAMX/Q, AMX/RAMX, ALU/NOTA"
ALU_NOT.RC[] "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, ALU/NOTA"
ALU_Q+D+1   "RAMX/Q, AMX/RAMX, RBMX/D, BMX/RBMX, ALU/A+B+1"
ALU_Q.OXT[]XOR.K[] "ALU/XOR, AMX/RAMX, OXT, DT/@1, RAMX/Q, BMX/KMX, KMX/@2"
ALU_Q+D     "RAMX/Q, AMX/RAMX, BMX/RBMX, ALU/A+B"
ALU_Q-SC    "KMX/SC, BMX/KMX, RAMX/Q, AMX/RAMX, ALU/A-B"
ALU_Q[]LB   "RAMX/Q, AMX/RAMX, BMX/LB, ALU/@1"
ALU_Q[]MASK "RAMX/Q, AMX/RAMX, BMX/MASK, ALU/@1"
ALU_Q.AND.MASK "RAMX/Q, AMX/RAMX, BMX/MASK, ALU/AND"
ALU_Q.OR.MASK "RAMX/Q, AMX/RAMX, BMX/MASK, ALU/OR"
alu_q.or.rc[] "lc_rc[01], amx/ramx, ramx/q, bmx/lc, alu/or"
ALU_Q.ORNOT.MASK "RAMX/Q, AMX/RAMX, BMX/MASK, ALU/ORNOT"
ALU_Q.XOR.RC[] "LC RC[01], AMX/RAMX, RAMX/Q, BMX/LC, ALU/XOR"
ALU_Q.XOR.R(SC) "LAB_R(SC), BMX/LB, AMX/RAMX, RAMX/Q, ALU/XOR"
ALU_Q[]K[]  "RAMX/Q, AMX/RAMX, KMX/@2, BMX/KMX, ALU/@1"
ALU_Q[]LC   "RAMX/Q, AMX/RAMX, BMX/LC, ALU/@1"
ALU_Q[]RC[] "AMX/RAMX, RAMX/Q, LC RC[02], BMX/LC, ALU/@1"
ALU_Q[]RC[] "AMX/RAMX, RAMX/Q, LAB_R[02], BMX/LB, ALU/@1"
ALU_R(SC)   "SPO.AC/LOAD, LAB, SPO.AC/SC, AMX/LA, ALU/A"
ALU_R(SC)[]K[] "LAB_R(SC), AMX/LA, ALU/@1, BMX/KMX, KMX/@2"
ALU_RLOG    "MSC7READ, RLOG, ALU/B"
ALU_R[][]K[] "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, KMX/@3, BMX/KMX, ALU/@2"
ALU_R[][]Q   "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, RBMX/Q, BMX/RBMX, ALU/@2"
ALU_R[]AND.MASK "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, BMX/MASK, ALU/AND"
ALU_R[]OR.MASK "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, BMX/MASK, ALU/OR"
ALU_R[]ORNOT.MASK "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, BMX/MASK, ALU/ORNOT"
alu_r[]xor.d "alu/xor, amx/la, spo.r/load, lab, spo.rab/@1, bmx/rbm, rbmx/d"
ALU_R[]XOR.LC "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, BMX/LC, ALU/XOR"
ALU_R[]-K[]  "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, KMX/@2, BMX/KMX, ALU/A-B"
ALU_R[]+K[]  "SPO.R/LOAD, LAB, SPO.RAB/@1, AMX/LA, KMX/@2, BMX/KMX, ALU/A+B"
ALU_SC      "KMX/SC, BMX/KMX, ALU/B"
BLEG_D      "BMX/RBMX, RBMX/D"
BLEG_LB     "BMX/LB"
BLEG_LC     "BMX/LC"
BLEG_Q      "BMX/RBMX, RBMX/Q"

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ZZ-ESKAH-V132 MICRO DIAGNOSTIC DEFINED MACROS

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CPSYNC      "ACF/SYNC"
DELAY       "CALL[DELAY]"
D_0-K[]    "AMX/RAMX, OXT, KMX/@1, BMX/KMX, ALU/A-B, D_ALU"
D_ACC      "DK/ACCEL"
D_D-LB     "RAMX/D, AMX/RAMX, BMX/LB, ALU/A-B, D_ALU"
D_D[]RC[]  "ALU D[@1]RC[@2], D_ALU"
D_D.AND.R[] "RBMX/D, BMX/RBMX, SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, ALU/AND, D_ALU"
D_D.ANDNOT.MASK "RAMX/D, AMX/RAMX, BMX/MASK, ALU/ANDNOT, D_ALU"
D_D.LEFT.Q "DK/LEFT, SI/DIV"
D_D.OR.R[] "RBMX/D, BMX/RBMX, SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, ALU/OR, D_ALU"
D_D.SXT[]+K[] "RAMX/D, AMX/RAMX, SXT, DT/@1, KMX/@2, BMX/KMX, ALU/A+B, D_ALU"
D_D.XOR.RC[] "RAMX/D, AMX/RAMX, SPO.R/LOAD.LC, SPO.RC/@1, BMX/LC, ALU7XOR, D_ALU"
d_k[].left "dk/shf, shf/left, alu k[@1]"
d_k[].left2 "dk/shf, shf/alu.dt, alu k[@1], dt/long"
d_k[].left3 "dk/shf, shf/left3, alu k[@1]"
D_LA+D     "AMX/LA, RBMX/D, BMX/RBMX, ALU/A+B, D_ALU"
D_LA.OR.D  "AMX/LA, RBMX/D, BMX/RBMX, ALU/OR, D_ALU"
D_MASK     "BMX/MASK, ALU/B, D_ALU"
D_MASK+1   "AMX/RAMX, OXT, BMX7MASK, ALU/A+B+1, D_ALU"
D_NOT.RC[] "AMX/RAMX, OXT, SPO.R/LOAD.LC, SPO.RC7@1, BMX/LC, ALU/ORNOT, D_ALU"
D_Q.OR.D   "RAMX/Q, AMX/RAMX, ALU/OR, SHF/ALU, DK/SHF, BMX/RBMX, RBMX/D"
D_MD       "DK/NOP"
d_q.ornot.d "d_alu, alu/ornot, amx/ramx, ramx/q, bmx/rbm, rbmx/d"
d_r[].and.d "d_alu, alu/and, amx/la, lab_r[@1], bmx/rbm, rbmx/d"
D_R[].LEFT "SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, ALU/A, SHF/LEFT, DK/SHF"
D_R[].OR.D "SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, RBMX/D, BMX/RBMX, ALU/OR, D_ALU"
d_r[].or.k[] "d_alu, alu r[@1].or.k[@2]"
D_R[].ORNOT.MASK "SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, BMX/MASK, ALU/ORNOT, D_ALU"
D_SC       "KMX/SC, BMX/KMX, ALU/B, SHF/ALU, DK/SHF"
EALU_STATE-K[] "EBMX/KMX, KMX/@1, MSC/LOAD.STATE, EALU/A-B"
EBMX_K[]   "KMX/@1, EBMX/KMX"
ENDQVR     "SUB/CALL, J/SCOPE"
ERLOOP     "SUB/CALL, J/ERLOOP"
ERROR1     "SUB/CALL, J/ERROR1"
ERROR2     "SUB/CALL, J/ERROR2"
force.err.r[] "d k[@1], q 0, call[force err r]"
LAB_R(PRN) "SPO.AC/LOAD.LAB, SPO.AC/R/PRN"
LAB_R(PRN+1) "SPO.AC/LOAD.LAB, SPO.AC/R/PRN+1"
LAB_R(SP1+1) "SPO.AC/LOAD.LAB, SPO.AC/R/SP1+1"
LAB_R(SRC!1) "SPO.AC/LOAD.LAB, SPO.AC/R11/SRC.OR.1"
LAB_R(SP2) "SPO.AC/LOAD.LAB, SPO.AC/R/SP2.SP2"
LAB_R(SP2.SP1) "SPO.AC/LOAD.LAB, SPO.AC/R/SP2.SP1"
NEWTST     "SUB/CALL, J/SCOPE"
NEWTST[]   "NEWTST, RC[OF], k[@1]"
NOP        "DK/NOP"
Q_ACC      "DK/ACCEL"
q_d.and.q  "q_alu, alu d[and]q"
Q_D[]Q     "RAMX/D, AMX/RAMX, BMX/RBMX, RBMX/Q, ALU/@1, Q_ALU"
Q_D[]RC[]  "RAMX/D, AMX/RAMX, SPO.R/LOAD.LC, SPO.RC/@2, BMX/LC, ALU/@1, Q_ALU"
q_k[].left "qk/shf, shf/left, alu k[@1]"
q_k[].left2 "qk/shf, shf/alu.dt, alu k[@1], dt/long"
q_k[].left3 "qk/shf, shf/left3, alu k[@1]"
Q_K(SP1)   "KMX/SP1.CON, BMX/KMX, ALU/B, Q_ALU"
Q_MASK+1   "AMX/RAMX, OXT, BMX/MASK, ALU/A+B+1, Q_ALU"
Q_NOT.MASK "AMX/RAMX, OXT, BMX/MASK, ALU/ORNOT, Q_ALU"
Q_Q.AND.LC "RAMX/Q, AMX/RAMX, BMX/LC, ALU/AND, Q_ALU"
Q_Q.AND.MASK "RAMX/Q, AMX/RAMX, BMX/MASK, ALU/AND, Q_ALU"
Q_Q.AND.R[] "RBMX/Q, BMX/RBMX, SPO.R/LOAD.LAB, SPO.RAB/@1, AMX/LA, ALU/AND, Q_ALU"

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ZZ-ESKAH-V132 MICRO DIAGNOSTIC DEFINED MACROS

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Q_Q.LEFT2      'QK/LEFT2'
q_q.or.rc[]    'q_alu,alu/or,amx/ramx,ramx/q,bmx/lc,lc,rc[01]''
Q_Q.XOR.D      'RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/XOR,D,ALU''
Q_Q.XOR.RC[]   'QK/SHF,AMX/RAMX,AMX/Q,BMX/LB,ALU/XOR,LAB,RC[01]''
q_r[].xor.d    'q_alu,alu_r[01].xor.d''
r[].la.and.d   'amx/la,rbmx/d,bmx/rbm,alu/and,shf/alu,spo.r/write.rab,spo.rab/01''
r[].alu.left2  'shf/alu.dt,dt/long,spo.r/write.rab,spo.rab/01''
r[].alu.left3  'shf/left3,spo.r/write.rab,spo.rab/01''
r[].d+lc       'r[01]_alu,alu_d+lc''
r[].not.k[]    'r[01]_alu,alu_not.k[02]''
RC[]_O-K[]     'AMX/RAMX.OXT,RMX/02,BMX/KMX,ALU/A-B,RC[01]_ALU''
RC[]_D+Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,RC[01]_ALU''
RC[]_D.AND.LA  'RBMX/D,BMX/RBMX,AMX/LA,ALU/AND,RC[01]_ALU''
rc[]_d.and.lc  'rc[01]_alu,alu/and,amx/ramx,ramx/d,bmx/lc''
rc[]_d.and.q   'rc[01]_alu,alu_d.and.q''
rc[]_d.andnot.k[] 'rc[01]_alu,alu_d[andnot]k[02]''
RC[]_D.ORNOT.MASK 'ALU D.ORNOT.MASK,RC[01]_ALU''
rc[]_d.xor.k[] 'rc[01]_alu,alu_d[xor]k[02]''
RC[]_D.XOR.LB  'ALEG D,BLEG LB,ALU/XOR,RC[01]_ALU''
RC[]_D.XOR.LC  'ALEG D,BLEG LC,ALU/XOR,RC[01]_ALU''
RC[]_D+MASK+1  'RAMX/D,AMX/RAMX,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/01''
RC[]_LA+D      'AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,RC[01]_ALU''
RC[]_LAB.XOR.LC 'ALEG LA,BLEG LC,ALU/XOR,RC[01]_ALU''
RC[]_MASK      'ALU MASK,RC[01]_ALU''
RC[]_NOT.O     'AMX/RAMX.OXT,DT/LONG,ALU/NOTA,RC[01]_ALU''
RC[]_NOT.D     'ALU NOT.D,RC[01]_ALU''
rc[]_not.k[]   'rc[01]_alu,alu_not.k[02]''
RC[]_NOT.MASK  'BMX/MASK,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT,RC[01]_ALU''
RC[]_Q+LC      'RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,RC[01]_ALU''
RC[]_Q.AND.LA  'RBMX/Q,BMX/RBMX,AMX/LA,ALU/AND,RC[01]_ALU''
RC[]_Q.OR.SC   'RAMX/Q,AMX/RAMX,KMX/SC,BMX/KMX,ALU/OR,RC[01]_ALU''
RC[]_Q+MASK    'RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A+B,RC[01]_ALU''
RC[]_Q+MASK+1  'RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/01''
RC[]_Q.XOR.LAB 'ALEG Q,BLEG LB,ALU/XOR,RC[01]_ALU''
RC[]_Q.XOR.LC  'ALEG Q,BLEG LC,ALU/XOR,RC[01]_ALU''
RC[]_SC        'ALU SC,RC[01]_ALU''
RC[]_SHF       'SPO.R/WRITE.RC,SPO.RC/01''
R[]_ALU.RIGHT2 'SHF/RIGHT2,SPO.R/WRITE.RAB,SPO.RAB/01''
R[]_D.AND.Q    'RAMX/D,AMX/RAMX,BMX/RBMX,ALU/AND,SPO.R/WRITE.RAB,SPO.RAB/01''
R[]_D.AND.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/02,BMX/LC,ALU/AND,RC[01]_ALU''
R[]_D.ANDNOT.MASK 'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ANDNOT,RC[01]_ALU''
R[]_D.ANDNOT.Q 'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,RC[01]_ALU''
R[]_D.LEFT     'RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT,SPO.RAB/01,SPO.R/WRITE.RAB''
R[]_D.OR.K[]   'RAMX/D,AMX/RAMX,KMX/02,BMX/KMX,ALU/OR,RC[01]_ALU''
R[]_D.ORNOT.MASK 'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT,RC[01]_ALU''
R[]_D.XOR.LAB  'ALEG D,BLEG LB,ALU/XOR,RC[01]_ALU''
R[]_D.XOR.LC   'ALEG D,BLEG LC,ALU/XOR,RC[01]_ALU''
R[]_LA.OR.K[]  'RC[01]_ALU,AMX/LA,BMX/KMX,KMX/02,ALU/OR''
R[]_LAB.XOR.LC 'ALEG LA,BLEG LC,ALU/XOR,RC[01]_ALU''
R[]_NOT.LA     'AMX/LA,ALU/NOTA,SPO.R/WRITE.RAB,SPO.RAB/01''
R[]_Q.XOR.LAB  'ALEG Q,BLEG LB,ALU/XOR,RC[01]_ALU''
R[]_Q.XOR.LC   'ALEG Q,BLEG LC,ALU/XOR,RC[01]_ALU''
R[]_SHF       'SPO.R/WRITE.RAB,SPO.RAB/01''
RETURN4       'SUB/RET,J/4''
sc_0-k[]-1    'sc_alu,alu/a-b-1,bmx/kmx,kmx/01,amx/ramx.Oxt''
sc_k[]+1      'sc_alu,alu/a+b+1,amx/ramx.Oxt,bmx/kmx,kmx/01''
SC_SC-1       'KMX/.1,EBMX/KMX,EALU/A-B,SMX/EALU,SCK/LOAD''
set.diag.mode[] 'd_k[01],call[set_diag_mode]''

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ZZ-ESKAH-V132 MICRO DIAGNOSTIC DEFINED MACROS

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set.ecc[] 'd_k[01],call[set_ecc]'
set.trap.mask[] 'sc_k[01],call[set_trap_mask]'
SETMCR[] 'R[0A]_K[01],CALL,J/SETMCR'
SETRCF[] 'SC_K[01],CALL,J/SETRCF'
SETRXCS[] 'R[0A]_K[01],CALL,J/SETRXCS'
SETTXCS[] 'R[0A]_K[01],CALL,J/SETTXCS'
SUBTEST 'CALL,J/SUBTST'
TRAP.FPA 'ACF/CONTROL,ACM/7'
TYPE_MSG_1 'D_K[.1],CALL[MSGCOM]'
TYPE_MSG_2 'D_K[.2],CALL[MSGCOM]'
TYPE_MSG_3 'D_K[.3],CALL[MSGCOM]'
TYPE_MSG_4 'D_K[.4],CALL[MSGCOM]'
TYPE_MSG_5 'CALL[MSGCOM],D_ALU.LEFT,SI/7,ALU_K[.2]'
TYPE_MSG_6 'D_K[.6],CALL[MSGCOM]'
TYPE_MSG_7 'D_K[.7],CALL[MSGCOM]'
TYPE_MSG_8 'D_K[.8],CALL[MSGCOM]'
TYPE_MSG_9 'D_K[.9],CALL[MSGCOM]'
TYPE_MSG_A 'D_K[.A],CALL[MSGCOM]'
TYPE_MSG_B 'CALL[MSGCOM],D_ALU.LEFT,SI/7,ALU_0+K[.4]+1'
TYPE_MSG_C 'CALL[MSGCOM],D_K[.C]'
TYPE_MSG_D 'CALL[MSGCOM],D_K[.D]'
TYPE_MSG_E 'CALL[MSGCOM],D_ALU.LEFT,SI/ZERO,ALU_K[.7]'
TYPE_MSG_F 'CALL[MSGCOM],D_K[.F]'
TYPE_RC[0E] 'CALL[RCECOM]'
TYP_MSG_1_CRLF 'D_K[.1],CALL[MSGCOM_CRLF]'
TYP_MSG_2_CRLF 'D_K[.2],CALL[MSGCOM_CRLF]'
TYP_MSG_3_CRLF 'D_K[.3],CALL[MSGCOM_CRLF]'
TYP_MSG_4_CRLF 'D_K[.4],CALL[MSGCOM_CRLF]'
TYP_MSG_5_CRLF 'CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/7,ALU_K[.2]'
TYP_MSG_6_CRLF 'D_K[.6],CALL[MSGCOM_CRLF]'
TYP_MSG_7_CRLF 'D_K[.7],CALL[MSGCOM_CRLF]'
TYP_MSG_8_CRLF 'D_K[.8],CALL[MSGCOM_CRLF]'
TYP_MSG_9_CRLF 'D_K[.9],CALL[MSGCOM_CRLF]'
TYP_MSG_A_CRLF 'D_K[.A],CALL[MSGCOM_CRLF]'
TYP_MSG_B_CRLF 'CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/7,ALU_0+K[.4]+1'
TYP_MSG_C_CRLF 'CALL[MSGCOM_CRLF],D_K[.C]'
TYP_MSG_D_CRLF 'CALL[MSGCOM_CRLF],D_K[.D]'
TYP_MSG_E_CRLF 'CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/ZERO,ALU_K[.7]'
TYP_MSG_F_CRLF 'CALL[MSGCOM_CRLF],D_K[.F]'
TYP_MSG_10_CRLF 'CALL[MSGCOM_CRLF],D_K[.10]'
TYP_MSG_11_CRLF 'CALL[MSGCOM_CRLF],D_ALU.ALU_0+K[.10]+1'
TYP_RC[0E]_CRLF 'CALL[RCECOM_CRLF]'
VA_D.OXT[] 'ALU_D.OXT[01],VA_ALU'
VA_D.OXT[]+K[] 'ALU_D.OXT[01]+K[02],VA_ALU'
VA_RC[]+K[] 'SPO.R/LOAD.LAB,SPO.RAB701,KMX/02,BMX/KMX,AMX/LA,ALU/A+B,VA_ALU'

```

; BRANCH DEFINITIONS

```

ALU.Z? 'BEN/ALU' ; NOTE J/XXB NESSECARY
ALU.C? 'BEN/ALU'
D1-0? 'BEN/D3-0'

```

.LIST

ZZ-ESKAH-V132 Table of Contents
ESKAH20.MCR MICRO2 1M(01) 16-DEC-82 10

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1807	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2099	TEST 40 MISCELLANEOUS D REGISTER FUNCTIONS TEST
: 2278	TEST 41 D SHIFT LEFT TEST
: 2325	TEST 42 D SHIFT RIGHT TEST
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: 2516	TEST 44 BEN/D.NE.0 TEST
: 2607	TEST 45 MISCELLANEOUS Q REGISTER FUNCTIONS TEST
: 2829	TEST 46 LEFT SHIFT Q REGISTER TEST
: 2908	TEST 47 RIGHT SHIFT Q REGISTER TEST
: 2984	TEST 48 FLOAT 1 THROUGH 0'S IN RA AND RB REGISTERS TEST
: 3042	TEST 49 FLOAT 0 THROUGH 1'S IN RA AND RB REGISTERS TEST
: 3104	TEST 4A RA AND RB REGISTERS FORWARD DUAL ADDRESSING TEST
: 3205	TEST 4B RA AND RB REGISTERS BACKWARD DUAL ADDRESSING TEST
: 3310	TEST 4C GALLOP 1'S IN RA AND RB REGISTERS TEST
: 3412	TEST 4D GALLOP 0'S IN RA AND RB REGISTERS TEST

ZZ-ESKAH-V132 Subroutines
ESKAH20.MCR

MICRO2 1M(01)

16-DEC-82 10:48:35

ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20

SEQ 0068
Page

:1
:1804 .NOLIST
:1805 .LIST

```
:1806 .TITLE 'ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20'
:1807 .TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1808 REGION/1000,13FF
:1809
:1810 *
:1811 FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1812 WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1813 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1814 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1815 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1816
:1817 FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1818 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1819 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1820 R[OF] AND DO A RETURN.
:1821
:1822 IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1823 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1824 TO THE CONSOLE.
:1825
:1826 -
:1827
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:1860
```

```
1100: SC_K[ZERO],J/TRPH1 ; SYSTEM INIT
1101: SC_K[.1],J/TRPH0 ; DATA UNALIGNED
1102: SC_K[.2],J/TRPH0 ; X PAGE ERROR
1103: SC_K[.3],J/TRPH0 ; TB MODIFY
1104: SC_K[.4],J/TRPH0 ; TB PROT ERROR
1105: SC_K[.6],J/TRPH0 ; TB MISS
1106: SC_K[.9],J/TRPH0 ; RES FLOAT OPER
1107: SC_K[.7],J/TRPH0 ; TB PARITY
1108: SC_K[.8],J/TRPH0 ; CACHE PARITY
110C: SC_K[.C],J/TRPH1 ; RDS
110D: SC_K[.D],J/TRPH1 ; TIME OUT
110E: SC_K[.10],J/TRPH0 ; ODD ADDRESS
110F: SC_K[.F],J/TRPH1 ; CS PARITY
TRPH0: Q_ID[USTACK]
Q-D,D,Q
ID[USTACK]_D
Q-D,D,Q
Q-R[OF]
ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
+
THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
TRAP CODE--INDICATES WHICH TRAP OCCURRED
FAULT STATUS REGISTER
SBI ERROR REGISTER
TIMEOUT ADDRESS REGISTER
MAINTENANCE REGISTER
CACHE PARITY REGISTER
TB ERROR REGISTER 1
TB ERROR REGISTER 0
```

```
U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,1006
U 1006, 0C00,003C,01E0,0800,0000,100B
U 100B, 0000,003C,8180,3C00,0000,100E
U 100E, 0C00,003C,01E0,0800,0000,1043
U 1043, 0000,003C,01C0,0A78,0000,1046
U 1046, 0001,2024,0180,0800,0010,1048
U 104B, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000
```

U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,713C :1862
U 1005, 0000,003C,49F0,2C00,0000,1053 :1863
U 1053, 0001,203C,4DF0,2DB0,0000,1054 :1864
U 1054, 0001,203C,65F0,2DB8,0000,1056 :1865
U 1056, 0001,203C,6DF0,2DD8,0000,105B :1866
U 105B, 0001,203C,75F0,2DE0,0000,105C :1867
U 105C, 0001,203C,79F0,2DC8,0000,1073 :1868
U 1073, 0001,203C,69F0,2DC0,0000,10CC :1869
U 10CC, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1124 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
:1880
U 10CE, 0000,003C,65F8,0800,0084,70D4 :1881
U 10D4, 0818,0038,8D80,0800,0000,10D6 :1882
U 10D6, 0D00,003C,0180,0800,0000,10DC :1883
U 10DC, 0000,003C,3D80,3C00,0000,10DE :1884
U 10DE, 0818,0038,0580,0800,0000,10E4 :1885
U 10E4, 0D00,003C,0180,0800,0000,10E6 :1886
U 10E6, 0F00,003C,3180,3C00,0000,10EC :1887
U 10EC, 0000,003C,5D80,3C00,0000,10EE :1888
U 10EE, 0000,003C,3980,3C00,0000,10F4 :1889
U 10F4, 0000,003C,2980,3C00,0000,10F6 :1890
U 10F6, 0000,003C,4980,3C00,0000,10FC :1891
U 10FC, 0818,0038,C180,0800,0000,10FE :1892
U 10FE, 0000,003C,6580,3C00,0000,1109 :1893
U 1109, 0F00,003C,6D80,3C00,0000,1114 :1894
U 1114, 0000,003C,6D80,3C00,0000,1116 :1895
U 1116, 0000,003C,6580,3C00,0000,111C :1896
U 111C, 0003,003C,0180,0AF8,0000,105E :1897
U 111E, 0818,0038,0980,0800,0000,105E :1898
U 1124, 0810,0038,0180,0978,0000,1126 :1899
U 1126, 0819,0034,4D80,0800,0000,104E :1900
U 104E, 0819,0030,1180,0800,0000,105E :1901
U 112C, 0810,0038,0180,0978,0000,112E :1902
U 112E, 0819,0034,4D80,0800,0000,105A :1903
U 105A, 0819,0030,D580,0800,0000,105E :1904
:1905
:1906
U 105E, 0000,003C,1D80,3C00,0000,105E :1907
:1908
:1909
:1910
U 13F0, 0000,003C,0180,0800,0000,13F1 :1911
U 13F1, 0000,003C,0180,0800,0000,13F2 :1912
U 13F2, 0000,003C,0180,0800,0000,13F3 :1913
U 13F3, 0000,003C,0180,0800,0000,13F4 :1914
U 13F4, 0000,003C,0180,0800,0000,13F5 :1915

:-
TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6]_Q,Q_ID[TBER1]
RC[7]_Q,Q_ID[SBI.ERR]
RC[0B]_Q,Q_ID[FAULT]
RC[0C]_Q,Q_ID[MAINT]
RC[9]_Q,Q_ID[PARITY]
RC[8]_Q,Q_ID[TIME.ADDR]
RC[0A]_Q,Q_ID[USTACK]
1000: RC[0E]_Q,ERROR1
:
+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2
:
SCOPE: SC_K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_K[.1F] : ...
D_DAL.SC
ID[PSL]_D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D_DAL.SC
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.TS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.TS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0F]_Q,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE
:
+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
:-
13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP

```

U 13F5, 0000,003C,0180,0800,0000,13F6 :1916
U 13F6, 0000,003C,0180,0800,0000,13F7 :1917
U 13F7, 0000,003C,0180,0800,0000,13F8 :1918
U 13F8, 0000,003C,0180,0800,0000,13F9 :1919
U 13F9, 0000,003C,0180,0800,0000,13FA :1920
U 13FA, 0000,003C,0180,0800,0000,13FB :1921
U 13FB, 0000,003C,0180,0800,0000,13FC :1922
U 13FC, 0000,003C,0180,0800,0000,13FD :1923
U 13FD, 0000,003C,0180,0800,0000,13FE :1924
U 13FE, 0000,003C,0180,0800,0000,13FF :1925
U 13FF, 0000,003C,0180,0800,0000,1155 :1926
U 1155, 0000,003C,0180,0800,0000,12AA :1927
U 12AA, 0000,003C,0180,0800,0000,1134 :1928

```

```

13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

```

```

;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-

```

```

U 1134, 0810,0038,4D80,0978,0000,1136 :1935
U 1136, 0019,4016,4D80,09F8,0000,0001 :1936

```

```

SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

```

```

;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-

```

```

U 113C, 0010,0038,01C0,0978,0000,113E :1942
U 113E, 0019,2034,4DC0,0800,0000,1144 :1943
U 1144, 0019,2032,1D80,09F8,0000,0001 :1944

```

```

SETRCF: Q RC[0F]
Q-Q,AND,K[.FF00]
RC[0F],Q.OR,SC,RETURN1

```

```

;+
; THIS ROUTINE IS USED TO DECREMENT THE TYPEOUT FLAG
;-

```

```

U 1146, 0000,003C,C1F0,2C00,0000,114C :1949
U 114C, 0819,2000,0580,0800,0000,114E :1950
U 114E, 0000,003E,C180,3C00,0000,0001 :1951

```

```

DECFLG: Q ID[TO]
D-Q-K[.1]
ID[TO],D,RETURN1

```

```

; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

```

```

U 1152, 0116,0038,1B80,0800,0000,115E :1954
U 1154, 0118,0038,0B80,0800,0000,115E :1955
U 1156, 0118,0038,0780,0800,0000,115E :1956
U 115C, 0118,0038,C380,0800,0000,115E :1957

```

```

S00: ALU_0(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX
=0000

```

```

U 1010, 0018,0038,1980,0800,0000,1152 :1959
U 1011, 0018,0038,1980,0800,0000,1154 :1960
U 1012, 0018,0038,1980,0800,0000,1156 :1961
U 1013, 0018,0038,1980,0800,0000,115C :1962
U 1014, 0018,0038,0980,0800,0000,1152 :1963
U 1015, 0018,0038,0980,0800,0000,1154 :1964
U 1016, 0018,0038,0980,0800,0000,1156 :1965
U 1017, 0018,0038,0980,0800,0000,115C :1966
U 1018, 0018,0038,0580,0800,0000,1152 :1967
U 1019, 0018,0038,0580,0800,0000,1154 :1968
U 101A, 0018,0038,0580,0800,0000,1156 :1969
U 101B, 0018,0038,0580,0800,0000,115C :1970

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11

```



```

U 101C, 0018,0038,C180,0800,0000,1152 :1971
U 101D, 0018,0038,C180,0800,0000,1154 :1972
U 101E, 0018,0038,C180,0800,0000,1156 :1973
U 101F, 0018,0038,C180,0800,0000,115C :1974
U 115E, 0100,003E,0380,0800,0000,0001 :1975
U 1164, 0018,0038,0580,0800,0000,1166 :1976
U 1166, 0118,0038,0780,0800,0000,116C :1977
U 116C, 0118,0038,0780,0800,0000,116E :1978
U 116E, 0118,0038,0780,0800,0000,1174 :1979
U 1174, 0118,0038,0780,0800,0000,1176 :1980
U 1176, 0118,0038,0780,0800,0000,117C :1981
U 117C, 0118,0038,0780,0800,0000,117E :1982
U 117E, 0118,0038,0780,0800,0000,1184 :1983
U 1184, 0100,003E,0380,0800,0000,0001 :1984
U 1186, 0018,0038,0980,0800,0000,118C :1985
U 118C, 0218,0038,0B80,0800,0000,118E :1986
U 118E, 0218,0038,0B80,0800,0000,1194 :1987
U 1194, 0218,0038,0B80,0800,0000,1196 :1988
U 1196, 0218,0038,0B80,0800,0000,119C :1989
U 119C, 0218,0038,0B80,0800,0000,119E :1990
U 119E, 0218,0038,0B80,0800,0000,11A2 :1991
U 11A2, 0218,0038,0B80,0800,0000,11A4 :1992
U 11A4, 0200,003E,0380,0800,0000,0001 :1993
U 11A6, 0F00,003C,0180,0800,0000,11AC :1994
U 11AC, 0819,0000,0580,0800,0000,1010 :1995
:1996
:1997
:1998
:1999
U 1020, 0019,2000,05C0,0800,0000,1021 :2000
U 1021, 0019,2000,05C0,0800,0000,1022 :2001
U 1022, 0019,2000,05C0,0800,0000,1023 :2002
U 1023, 0019,2000,05C0,0800,0000,1024 :2003
U 1024, 0019,2000,05C0,0800,0000,1025 :2004
U 1025, 0019,2000,05C0,0800,0000,1026 :2005
U 1026, 0019,2000,05C0,0800,0000,1027 :2006
U 1027, 0019,2000,05C0,0800,0000,1028 :2007
U 1028, 0019,2000,05C0,0800,0000,1029 :2008
U 1029, 0019,2000,05C0,0800,0000,102A :2009
U 102A, 0019,2000,05C0,0800,0000,102B :2010
U 102B, 0019,2000,05C0,0800,0000,102C :2011
U 102C, 0019,2000,05C0,0800,0000,102D :2012
U 102D, 0019,2000,05C0,0800,0000,102E :2013
U 102E, 0019,2000,05C0,0800,0000,102F :2014
U 102F, 0001,203C,0180,0800,0010,11AE :2015
U 11AE, 001D,2114,01C0,0800,0000,100C :2016
U 100C, 0000,003E,0180,0800,0000,0001 :2017
U 100D, 0000,003E,0180,0800,0000,0002 :2018
:2019
:2020
U 1030, 0001,203E,0180,0A80,0000,0001 :2021
U 1031, 0001,203E,0180,0A88,0000,0001 :2022
U 1032, 0001,203E,0180,0A90,0000,0001 :2023
U 1033, 0001,203E,0180,0A98,0000,0001 :2024
U 1034, 0001,203E,0180,0AA0,0000,0001 :2025

```

```

DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D-D.LEFT2,SI/7,RETURN1
DCAAAA: ALU_K[.1]

```

```

ALU_K[.1],D-D.LEFT2,SI/7
ALU_K[.1],D-D.LEFT2,SI/7
ALU_K[.1],D-D.LEFT2,SI/7
ALU_K[.1],D-D.LEFT2,SI/7
ALU_K[.1],D-D.LEFT2,SI/7
ALU_K[.1],D-D.LEFT2,SI/7
D-D.LEFT2,SI/7,RETURN1

```

```

DRAAAA: ALU_K[.2]
ALU_K[.2],D-D.RIGHT2,SI/7
ALU_K[.2],D-D.RIGHT2,SI/7
ALU_K[.2],D-D.RIGHT2,SI/7
ALU_K[.2],D-D.RIGHT2,SI/7
ALU_K[.2],D-D.RIGHT2,SI/7
ALU_K[.2],D-D.RIGHT2,SI/7
D-D.RIGHT2,SI/7,RETURN1

```

```

DC.NF: D_0
D-D-K[.1],J/DCO

```

```

; THIS TABLE IS USED AS A TARGET TO TEST BRANCHES.
; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
=0000

```

```

BRTBLE: Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]

```

```

BRT1: Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]

```

```

BRT2: Q-Q-K[.1]
Q-Q-K[.1]
Q-Q-K[.1]

```

```

ALU_Q,CLK.UBCC
Z?,ALU_Q+D,Q_ALU
=0
RETURN1
RETURN2

```

```

; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
=0000

```

```

WRRARB: R[0]_Q,RETURN1
R[1]_Q,RETURN1
R[2]_Q,RETURN1
R[3]_Q,RETURN1
R[4]_Q,RETURN1

```

```

U 1035, 0001,203E,0180,0AA8,0000,0001 :2026
U 1036, 0001,203E,0180,0AB0,0000,0001 :2027
U 1037, 0001,203E,0180,0AB8,0000,0001 :2028
U 1038, 0001,203E,0180,0AC0,0000,0001 :2029
U 1039, 0001,203E,0180,0AC8,0000,0001 :2030
U 103A, 0001,203E,0180,0AD0,0000,0001 :2031
U 103B, 0001,203E,0180,0AD8,0000,0001 :2032
U 103C, 0001,203E,0180,0AE0,0000,0001 :2033
U 103D, 0001,203E,0180,0AE8,0000,0001 :2034
U 103E, 0001,203E,0180,0AF0,0000,0001 :2035
U 103F, 0001,203E,0180,0AF8,0000,0001 :2036
:2037
:2038
:2039
U 1060, 0000,003E,0180,0A00,0000,0001 :2040
U 1061, 0000,003E,0180,0A08,0000,0001 :2041
U 1062, 0000,003E,0180,0A10,0000,0001 :2042
U 1063, 0000,003E,0180,0A18,0000,0001 :2043
U 1064, 0000,003E,0180,0A20,0000,0001 :2044
U 1065, 0000,003E,0180,0A28,0000,0001 :2045
U 1066, 0000,003E,0180,0A30,0000,0001 :2046
U 1067, 0000,003E,0180,0A38,0000,0001 :2047
U 1068, 0000,003E,0180,0A40,0000,0001 :2048
U 1069, 0000,003E,0180,0A48,0000,0001 :2049
U 106A, 0000,003E,0180,0A50,0000,0001 :2050
U 106B, 0000,003E,0180,0A58,0000,0001 :2051
U 106C, 0000,003E,0180,0A60,0000,0001 :2052
U 106D, 0000,003E,0180,0A68,0000,0001 :2053
U 106E, 0000,003E,0180,0A70,0000,0001 :2054
U 106F, 0000,003E,0180,0A78,0000,0001 :2055
:2056
:2057
:2058
U 1044, 0F00,003D,0180,0800,0000,11A6 :2059
U 1045, 0000,003C,0180,0800,0000,104C :2060
:2061
U 104C, 0000,193D,0180,0800,0000,1030 :2062
U 104D, 0819,0014,0580,0800,0010,11B4 :2063
U 11B4, 0000,013C,0180,0800,0000,1058 :2064
U 1058, 0000,003C,0180,0800,0000,104C :2065
U 1059, 0000,003E,0180,0800,0000,0001 :2066
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```

```

R[5]-Q,RETURN1
R[6]-Q,RETURN1
R[7]-Q,RETURN1
R[8]-Q,RETURN1
R[9]-Q,RETURN1
R[0A]-Q,RETURN1
R[0B]-Q,RETURN1
R[0C]-Q,RETURN1
R[0D]-Q,RETURN1
R[0E]-Q,RETURN1
R[0F]-Q,RETURN1

```

```

: THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
: INTO LA AND LB.
=0000

```

```

LTCHAB: LAB_R[0],RETURN1
LAB_R[1],RETURN1
LAB_R[2],RETURN1
LAB_R[3],RETURN1
LAB_R[4],RETURN1
LAB_R[5],RETURN1
LAB_R[6],RETURN1
LAB_R[7],RETURN1
LAB_R[8],RETURN1
LAB_R[9],RETURN1
LAB_R[0A],RETURN1
LAB_R[0B],RETURN1
LAB_R[0C],RETURN1
LAB_R[0D],RETURN1
LAB_R[0E],RETURN1
LAB_R[0F],RETURN1

```

```

: THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
: CONTENTS OF Q.
=0

```

```

RARB.Q: D 0,CALL,J/DC.NF
NOP

```

```

=0
RARB.QA: CALL,D3-0?,J/WRRARB
D D+K[1],CLK.UBCC
Z?
=0
J/RARB.QA
RETURN1

```

```

*****

```

```

+
THIS ROUTINE CHECKS ID[TO] (THE TYPE OUT FLAG).
IF ID[TO] IS NEGATIVE, THE MESSAGE IS TYPED, AND ID[TO]
IS INCREMENTED. THIS IS THE COMMUNICATION DEVICE BETWEEN
ESKAE (THE MICRO TEST MONITOR), AND THE GO CHAIN OVERLAYS
TO TELL WHETHER LOOP ON TEST OR SECTION HAS BEEN SPECIFIED.

```

```

MSGCOM: IS USED BY A MACRO CALL 'TYP[E]_MSG_X[CRLF]' WHERE D STILL
NEEDS TO BE SHIFTED 9 PLACES.
CNFCOM: IS USED BY THE SUBROUTINE 'CONFIG' WHERE D DOES
NOT NEED ANY FURTHER SHIFTING.
-
*****

```

```
U 11B6, 0000,003C,F580,0800,0084,71BC :2081 MSGCOM: SC_K[A]
:2082 MSGCOM_1:
U 11BC, 0000,003C,0180,0800,0100,11BE :2083 FE_SC
U 11BE, 0000,003C,D9F8,0800,0084,71C4 :2084 SC_K[.9],Q_0
U 11C4, 0D00,003C,0180,0800,0000,11C6 :2085 D_BAL.SC
U 11C6, 0000,003C,C1F0,2C00,0000,11CC :2086 CNFCOM: Q_ID[TO]
U 11CC, 0C01,203C,01E0,0800,0010,11CE :2087 ALU_Q,CLK.UBCC,Q_D,D_Q
U 11CE, 0819,1B14,0580,0800,0000,1007 :2088 ALU.N?,D_D+K[.1]
U 1007, 0C00,003E,0180,0800,0000,0001 :2089 =0111 RETURN1,D_Q
U 100F, 0C00,003C,C180,3C00,0081,11D4 :2090 ID[TO]_D_D_Q,SC_FE
U 11D4, 0819,0030,1D80,0800,0000,105E :2091 D_D.OR.K[SC],J/CALLCON
:2092
:2093 RCECOM_CRLF:
U 11D6, 0000,003C,2180,0800,0084,71BC :2094 SC_K[.14],J/MSGCOM_1
:2095 MSGCOM_CRLF:
U 11DC, 0018,0038,65C0,0800,0000,11DE :2096 Q_K[.10]
U 11DE, 0019,2030,0980,0800,0082,11BC :2097 SC_Q.OR.K[.2],J/MSGCOM_1
:2098
```

.2099 .PAGE "TEST 40 MISCELLANEOUS D REGISTER FUNCTIONS TEST"

.2100 *****

.2101 **
.2102 TEST 40 MISCELLANEOUS D REGISTER FUNCTIONS TEST

.2103
.2104 TEST DESCRIPTION
.2105 THIS IS A TEST OF SINGLE AND DOUBLE LEFT
.2106 AND RIGHT SHIFTS IN THE D REGISTER. ALSO TESTED ARE
.2107 VARIOUS SHIFT INPUTS AND BRANCH CONDITIONS.

.2108
.2109 LOGIC DESCRIPTION
.2110 TESTED HERE ARE:
.2111 LOGIC LOCATION (MODULE NAME)
.2112 UDK FIELD DECODE DBP
.2113 D REGISTER DBP
.2114 DMX DBP
.2115 USI FIELD DECODE DAP
.2116 D REG USI MUX DAP
.2117 D REG BRANCH CONDITIONS DBP
.2118 BRANCH CONDITION MUX ICL

.2119
.2120 ERROR DESCRIPTION
.2121 D REGISTER RESULT
.2122 ERROR CODE: AS GIVEN BY THE FOLLOWING TABLE

SUBTEST #	VALUE	MEANING
1	NOT APPLICABLE	
2	0	BEN/D (D.NE.0?) FAILED
	1	BEN/D (D31?) FAILED
	2	D.D.RIGHT FAILED
3	0	D.D.LEFT *OR* BEN/D (D31?) FAILED
	1	BEN/D (D0?) FAILED
4	0	BEN/D (D0?) FAILED
	1	SI/2 OR SI/4 FAILED
5	NOT APPLICABLE	
6	0	SI/7 FAILED TO SHIFT IN 0
	1	SI/7 FAILED TO SHIFT IN 1

.2136
.2137 --
.2138 *****

.2139 =0
.2140 DREG: NEWTST
.2141 RC[0F] K[.2]
.2142 ://///////////////

.2143 :+
.2144 : SUBTEST 1
.2145 : CLEAR D AND BEN D.NE.0 TEST

.2146 :-
.2147 =0
.2148 DPT1: SUBTEST
.2149 NOP
.2150 =0 ERLOOP
.2151 D 0,ALU 0-K[.1]
.2152 D.NE.0?,RC[0E],D : TEST INSTRUCTION
.2153 : BEN D#0

U 1074, 0000,003D,0180,0800,0000,10CE
U 1075, 0018,0038,0980,09F8,0000,1078

U 1078, 0000,003D,0180,0800,0000,1134
U 1079, 0000,003C,0180,0800,0000,107A
U 107A, 0000,003D,0180,0800,0000,111E
U 107B, 0F1B,0000,0580,0800,0000,11E4
U 11E4, 0001,0D3C,0180,09F0,0000,1055


```

U 1055, 0000,003C,0180,0800,0000,107C :2154
U 1057, 0018,0039,0580,09E8,0000,1124 :2155
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```

:2209 : USI MUX SELECTS
:2210 : BEN DO? (ASSERTED)
:2211 :
:2212 :
:2213 DPT4: SUBTEST
:2214 RC[OD]_0 ; ERROR #0
:2215 =0 ERLOOP-
:2216 ALU_0-K[.1],D_ALU,Q_ALU ;
:2217 DO?,RC[OE]_D
:2218 =1110 ERROR1 ; BEN DO? FAILED
:2219 RC[OD]_K[.1] ; ERROR #1
:2220 ALU_K[FFFF] ; PRESENT ALL 1'S TO OTHER
:2221 D_D.RIGHT,SI/4 ; USI INPUTS, TEST ALL GROUNDED
:2222 D31?,RC[OE]_D ; INPUT PINS
:2223 =110 J/DPT4A
:2224 ERROR1 ; USI MUX SELECTS FAILED
:2225 DPT4A: ALU_K[FFFF] ; LATCH 1'S IN PREV ALU REG
:2226 D_D.RIGHT,SI/2 ; TEST 0 INPUT AT SELECTS=2
:2227 D31?,RC[OE]_D
:2228 =110 J/DPT5
:2229 ERROR1 ; USI MUX SELECTS FAILED
:2230 :
:2231 :
:2232 : SUBTEST 5
:2233 : RIGHT SHIFT D DOUBLE
:2234 : LEFT SHIFT D DOUBLE
:2235 :
:2236 :
:2237 DPT5: SUBTEST
:2238 RC[OD]_0 ; ERROR #0
:2239 =0 ERLOOP-
:2240 D_K[.4]
:2241 D_D.RIGHT2,SI/ZERO ; TEST INSTRUCTION
:2242 ACU D-K[.1],CLK.UBCC ; SEE IF IT SHIFTED
:2243 Z?,RC[OE]_D
:2244 =0 ERROR1 ; D_D.RIGHT2 FAILED
:2245 D_D.LEFT2,SI/ZERO ; TEST INSTRUCTION
:2246 ACU D-K[.4],CLK.UBCC ; SEE IF IT SHIFTED BACK
:2247 Z?,RC[OE]_D
:2248 =0 ERROR1 ; D_D.LEFT2 FAILED
:2249 NOP
:2250 :
:2251 :
:2252 : SUBTEST 6
:2253 : PREVIOUS ALU REGISTER (FIRST '1' TO BE SHIFTED INTO D)
:2254 : USI=7
:2255 :
:2256 :
:2257 DPT6: SUBTEST
:2258 RC[OE]_0 ; ERROR #0
:2259 =0 ERLOOP-
:2260 ALU_0(K),Q_0,D_0
:2261 D_D.LEFT2,SI/7-
:2262 ACU D,CLK.UBCC
:2263 Z?,RC[OE]_D

```

U 108A, 0000,003D,0180,0800,0000,1134
 U 108B, 0003,003C,0180,09E8,0000,108C
 U 108C, 0000,003D,0180,0800,0000,111E
 U 108D, 081B,0000,05C0,0800,0000,12EE
 U 12EE, 0001,193C,0180,09F0,0000,108E
 U 108E, 0000,003D,0180,0800,0000,1124
 U 108F, 0018,0038,0580,09E8,0000,12EF
 U 12EF, 0018,0038,C180,0800,0000,12F0
 U 12F0, 0600,003C,0200,0800,0000,12F1
 U 12F1, 0001,0D3C,0180,09F0,0000,1096
 U 1096, 0000,003C,0180,0800,0000,12F2
 U 1097, 0000,003D,0180,0800,0000,1124
 U 12F2, 0018,0038,C180,0800,0000,12F3
 U 12F3, 0600,003C,0100,0800,0000,12F4
 U 12F4, 0001,0D3C,0180,09F0,0000,109E
 U 109E, 0000,003C,0180,0800,0000,1090
 U 109F, 0000,003D,0180,0800,0000,1124

U 1090, 0000,003D,0180,0800,0000,1134
 U 1091, 0003,003C,0180,09E8,0000,1092
 U 1092, 0000,003D,0180,0800,0000,111E
 U 1093, 0818,0038,1180,0800,0000,12F5
 U 12F5, 0200,003C,0180,0800,0000,12F6
 U 12F6, 0019,0000,0580,0800,0010,12F7
 U 12F7, 0001,013C,0180,09F0,0000,1094
 U 1094, 0000,003D,0180,0800,0000,1124
 U 1095, 0100,003C,0180,0800,0000,12F8
 U 12F8, 0019,0000,1180,0800,0010,12F9
 U 12F9, 0001,013C,0180,09F0,0000,1098
 U 1098, 0000,003D,0180,0800,0000,1124
 U 1099, 0000,003C,0180,0800,0000,109A

U 109A, 0000,003D,0180,0800,0000,1134
 U 109B, 0003,003C,0180,09F0,0000,109C
 U 109C, 0000,003D,0180,0800,0000,111E
 U 109D, 0F18,0038,19F8,0800,0000,12FA
 U 12FA, 0100,003C,0380,0800,0000,12FB
 U 12FB, 0001,003C,0180,0800,0010,12FC
 U 12FC, 0001,013C,0180,09F0,0000,10A0

```

U 10A0, 0000,003D,0180,0800,0000,1124 :2264 =0 ERROR1 ; PREV ALU REG OR IT'S DCP
:2265 ; SOURCE FAILED
U 10A1, 0F18,0038,05F8,09E8,0000,12FD :2266 ALU_K[.1],Q_0,RC[OD]_ALU,D_0
U 12FD, 0100,003C,0380,0800,0000,12FE :2267 D_D.LEFT2,SI/? ; FIRST ATTEMPT AT A''1''INPUT
U 12FE, 0019,0000,0980,0800,0010,12FF :2268 ACU_D-K[.2],CLK.UBCC
U 12FF, 0001,013C,0180,09F0,0000,10A2 :2269 Z?,RC[OE]_D
U 10A2, 0000,003D,0180,0800,0000,1124 :2270 =0 ERROR1 ; PREV ALU,DCP,CHIP ITSELF
:2271 ; OR INPUT TIED LOW
U 10A3, 0F18,0038,09F8,09E8,0000,1300 :2272 ALU_K[.2],RC[OD]_ALU,D_0,Q_0
U 1300, 0100,003C,0380,0800,0000,1301 :2273 D_D.LEFT2,SI/?
U 1301, 0019,0000,0580,0800,0010,1302 :2274 ACU_D-K[.1],CLK.UBCC
U 1302, 0001,013C,0180,09F0,0000,10A4 :2275 Z?,RC[OE]_D
U 10A4, 0000,003D,0180,0800,0000,1124 :2276 =0 ERROR1 ; PREV ALU REG OR DCP FAILED
U 10A5, 0000,003C,0180,0800,0000,10A8 :2277 NOP

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:2315
:2316
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:2318
:2319
:2320
:2321
:2322
:2323
:2324
U 10A8, 0000,003D,0180,0800,0000,10CE
U 10A9, 0F00,003C,0180,0800,0000,10AA
U 10AA, 0000,003D,0180,0800,0000,1164
U 10AB, 0000,003C,0180,0800,0000,10AC
U 10AC, 0000,003D,0180,0800,0000,1164
U 10AD, 0018,0038,0980,09F8,0000,1303
U 1303, 0001,003C,0180,09F0,0000,1304
U 1304, 0000,0D3C,0180,0800,0000,10A6
U 10A6, 0001,003D,0180,09E8,0000,1124
U 10A7, 0500,003C,0180,0800,0000,1305
U 1305, 0000,0D3C,0180,0800,0000,10AE
U 10AE, 0500,003C,0180,0800,0000,1306
U 10AF, 0001,003D,0180,09E8,0000,1124
U 1306, 0000,0D3C,0180,0800,0000,10B6
U 10B6, 0001,003D,0180,09E8,0000,1124
U 10B7, 0500,003C,0180,0800,0000,1307
U 1307, 0000,0D3C,0180,0800,0000,10BE
U 10BE, 0500,003C,0180,0800,0000,1308
U 10BF, 0001,003D,0180,09E8,0000,1124
U 1308, 0000,0D3C,0180,0800,0000,10C6
U 10C6, 0001,003D,0180,09E8,0000,1124
U 10C7, 0000,003C,0180,0800,0000,10B0

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```

.PAGE 'TEST 41 D SHIFT LEFT TEST'
*****
++
TEST 41 D SHIFT LEFT TEST

TEST DESCRIPTION
D LEFT SHIFT TEST. FILL D WITH ALTERNATING
1'S AND 0'S. THEN LEFT SHIFT 4 BITS OUT OF D AND TEST
EACH.

LOGIC DESCRIPTION
THIS IS A TEST OF LOGIC ENTIRELY ON THE DBP MODULE.

ERROR DESCRIPTION
D AFTER BEING FILLED WITH ALTERNATING 1'S AND 0'S
D=AAAAAAAA
D AFTER BEING SHIFTED ONE PLACE LEFT (SHIFT IN 0)

--
*****
=0
DPT15: NEWTST
D 0 ; D=0
; EACH OF THESE CALLS TO DCAAAA WILL SHIFT 16 BITS
; OF THE ALTERNATING 1'S AND 0'S TEST PATTERN
; INTO D.
=0 CALL J/DCAAAA ; D=0000AAAA
NOP ;
=0 CALL J/DCAAAA ; D=0AAAAAAAA
RC[0F]_K[.2] ;
RC[0E]_D ; SAVE D IN RC[0E]
; SHOULD BE D=0AAAAAAAA
; BEN D<31>
D31?
=110 ERROR1,RC[0D]_D
D D.LEFT,SI/ZERO ; D=55555554
; BEN D<31>
D31?
=110 D D.LEFT,SI/ZERO,J/DPT15C ; D=AAAAAAAB
ERROR1,RC[0D]_D
DPT15C: D31? ; BEN D<31>
=110 ERROR1,RC[0D]_D
D D.LEFT,SI/ZERO ; D=55555550
; BEN D<31>
D31?
=110 D D.LEFT,SI/ZERO,J/DPT15E ; D=AAAAAAAO
ERROR1,RC[0D]_D
DPT15E: D31?
=110 ERROR1,RC[0D]_D
NOP

```



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U 10B0, 0000,003D,0180,0800,0000,10CE
U 10B1, 0F00,003C,0180,0800,0000,10B2
:2349
:2350
:2351
:2352
U 10B2, 0000,003D,0180,0800,0000,1164
U 10B3, 0000,003C,0180,0800,0000,10B4
U 10B4, 0000,003D,0180,0800,0000,1164
:2353
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:2356
U 10B5, 0018,0038,0980,09F8,0000,1309
U 1309, 0001,003C,01E0,09F0,0000,10B8
:2357
:2358
:2359
:2360
:2361
U 10B8, 0F00,003D,0180,0800,0000,1186
U 10B9, 0000,003C,0180,0800,0000,10BA
U 10BA, 0000,003D,0180,0800,0000,1186
:2362
:2363
:2364
:2365
U 10BB, 0001,003C,0180,09E8,0000,130A
:2366
:2367
:2368
U 130A, 001D,2000,0180,0800,0010,130B
U 130B, 0000,013C,0180,0800,0000,10BC
U 10BC, 0000,003D,0180,0800,0000,1124
U 10BD, 0000,003C,0180,0800,0000,10C0
:2369
:2370
:2371
:2372

```

```

.PAGE "TEST 42 D SHIFT RIGHT TEST"
*****
++
TEST 42 D SHIFT RIGHT TEST

TEST DESCRIPTION
D RIGHT SHIFT TEST. FIRST USE D LEFT
SHIFT FUNCTION TO GENERATE EXPECTED DATA.
THEN RIGHT SHIFT A 32-BIT ALTERNATING 0'S
AND 0'S TEST PATTERN INTO D. THEN USE ALU
FUNCTION A-B TO CHECK THE RIGHT SHIFT
RESULT AGAINST THE LEFT SHIFTED RESULT WHICH
IS KNOWN TO BE CORRECT.

LOGIC DESCRIPTION
THIS TESTS LOGIC ON THE DBP MODULE.

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--
*****
=0
DPT16: NEWTST
D 0
; GENERATE EXPECTED RESULT, D=0AAAAAAAA, USING
LEFT SHIFTS.
=0 CALL,J/DCAAAA
NOP
=0 CALL,J/DCAAAA ; D=0AAAAAAAA
; SAVE THIS EXPECTED DATA IN Q AND RC[0E]
RC[0F] K[.2]
Q D,RC[0E] D
; GENERATE RIGHT SHIFTS IN D USING THE ROUTINE
DRAAAA, WHICH WILL RIGHT SHIFT A 16 BIT PATTERN
OF ALTERNATING 1'S AND 0'S INTO D.
=0 D 0,CALL,J/DRAAAA ; D=0AAAA0000
NOP
=0 CALL,J/DRAAAA ; D=0AAAAAAAA
; SAVE RESULTANT D IN R2
RC[0D] D
; CMP RESULT IN D WITH EXPECTED RESULT IN Q.
; Q SHOULD EQUAL D, SO Q-D SHOULD EQUAL 0.
ALU_Q-D,CLK.UBCC
Z?
; RESULT CORRECT?
=0 ERROR1 ; RIGHT SHIFT D FUNCTION FAILED.
NOP

```

U 10C0, 0000,003D,0180,0800,0000,10CE
U 10C1, 0018,0038,0980,09F8,0000,10C2

U 10C2, 0000,003D,0180,0800,0000,1134
U 10C3, 0000,003C,0180,0800,0000,10C4
U 10C4, 0000,003D,0180,0800,0000,111E
U 10C5, 0F03,003C,0180,09E8,0000,10C8
U 10C8, 0000,003D,0180,0800,0000,101F
U 10C9, 0000,003C,01E0,0800,0000,130C
U 130C, 0F00,003C,0180,0800,0000,1008
U 1008, 0000,193D,0180,0800,0000,1020
U 1009, 0001,203D,0180,09F0,0000,1124
U 100A, 0000,003C,0180,0800,0000,10CA

```

:2373 .PAGE "TEST 43 BEN/D3-0 TEST"
:2374 *****
:2375 ++
:2376 TEST 43 BEN/D3-0 TEST
:2377
:2378 TEST DESCRIPTION
:2379 EACH OF THE D REGISTERS BITS<03:00> IS ASSERTED
:2380 BY ITSELF AND THE BRANCH TAKEN.
:2381
:2382 LOGIC DESCRIPTION
:2383 THIS IS A TEST LOGIC ON THE DBP MODULE WHICH
:2384 DECODES AND ENABLES THIS BRANCH CONDITION.
:2385
:2386 ERROR DESCRIPTION
:2387 LOW ORDER 4 BITS OF WHERE THE BRANCH ACTUALLY WENT
:2388 EXPECTED LOW ORDER 4 BITS (TESTED BIT SET)
:2389
:2390 --
:2391 *****
:2392 =0
:2393 BD30: NEWTST
:2394 RC[0F]_K[.2]
:2395 //////////////////////////////////////
:2396 +
:2397 SUBTEST 1
:2398 TEST BEN D3-0, WITH D<03:00>=0
:2399 NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
:2400 FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
:2401 IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
:2402 OF THE BEN/D3-0, COMPUTE THE VALUE OF
:2403 Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
:2404 RETURN2, OTHERWISE RETURN1 WILL BE USED
:2405 TO RETURN HERE.
:2406
:2407 =0
:2408 DPT19: SUBTEST
:2409 NOP
:2410 =0 ERLOOP
:2411 D 0,RC[0D]_0
:2412 =0 CALL,J/DCF : D=0F
:2413 Q_D : Q=0F
:2414 D-0
:2415 =00 CALL,D3-0?,J/BRTBLE : TEST INSTRUCTION
:2416 ERROR1,RC[0E]_Q : BEN/D3-0 FAILED WITH D<03:00>
:2417 : ZEROES.
:2418 NOP
:2419 =
:2420 //////////////////////////////////////
:2421 +
:2422 SUBTEST 2
:2423 TEST BEN D3-0, WITH D<03:00>=1
:2424 NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
:2425 FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
:2426 IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
:2427 OF THE BEN/D3-0, COMPUTE THE VALUE OF

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:2428
:2429
:2430
:2431
U 10CA, 0000,003D,0180,0800,0000,1134 :2432
U 10CB, 0000,003C,0180,0800,0000,10D0 :2433
U 10D0, 0000,003D,0180,0800,0000,111E :2434
U 10D1, 0F18,0038,0580,09E8,0000,10D2 :2435
U 10D2, 0000,003D,0180,0800,0000,101E :2436
U 10D3, 0000,003C,01E0,0800,0000,10D8 :2437
U 10D8, 0000,003D,0180,0800,0000,1011 :2438
U 10D9, 0000,003C,0180,0800,0000,1040 :2439
U 1040, 0000,193D,0180,0800,0000,1020 :2440
U 1041, 0001,203D,0180,09F0,0000,1124 :2441
U 1042, 0000,003C,0180,0800,0000,10DA :2442
:2443
:2444
:2445
:2446
:2447
:2448
:2449
:2450
:2451
:2452
:2453
:2454
:2455
U 10DA, 0000,003D,0180,0800,0000,1134 :2456
U 10DB, 0000,003C,0180,0800,0000,10E0 :2457
U 10E0, 0000,003D,0180,0800,0000,111E :2458
U 10E1, 0F18,0038,0980,09E8,0000,10E2 :2459
U 10E2, 0000,003D,0180,0800,0000,101D :2460
U 10E3, 0000,003C,01E0,0800,0000,10E8 :2461
U 10E8, 0000,003D,0180,0800,0000,1012 :2462
U 10E9, 0000,003C,0180,0800,0000,1048 :2463
U 1048, 0000,193D,0180,0800,0000,1020 :2464
U 1049, 0001,203D,0180,09F0,0000,1124 :2465
U 104A, 0000,003C,0180,0800,0000,10EA :2466
:2467
:2468
:2469
:2470
:2471
:2472
:2473
:2474
:2475
:2476
:2477
:2478
:2479
U 10EA, 0000,003D,0180,0800,0000,1134 :2480
U 10EB, 0000,003C,0180,0800,0000,10F0 :2481
U 10F0, 0000,003D,0180,0800,0000,111E :2482

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: Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
: RETURN2, OTHERWISE RETURN1 WILL BE USED
:
:
=0
DPT20: SUBTEST
      NOP
=0      ERLOOP
      D 0,RC[0D]_K[.1]
=0      CALL,J/DCE          : D=0E
      Q D                  : Q=0E
=0      CALL,J/DC1          : D<03:00>=1
      NOP
=00     CALL,D3-0?,J/BRTBLE : TEST INSTRUCTION
      ERROR1,RC[0E]_Q
      NOP
=
: //////////////////////////////////////
:
+
: SUBTEST      3
: TEST BEN D3-0 WITH D<03:00>=2
: NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
: FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
: IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
: OF THE BEN/D3-0, COMPUTE THE VALUE OF
: Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
: RETURN2, OTHERWISE RETURN1 WILL BE USED
:
:
=0
DPT21: SUBTEST
      NOP
=0      ERLOOP
      D 0,RC[0D]_K[.2]
=0      CALL,J/DCD          : D=0D
      Q D                  : Q=0D
=0      CALL,J/DC2          : D<03:00>=2
      NOP
=00     CALL,D3-0?,J/BRTBLE : TEST INSTRUCTION
      ERROR1,RC[0E]_Q
      NOP
=
: //////////////////////////////////////
:
+
: SUBTEST      4
: TEST BEN D3-0, WITH D<03:00>=4
: NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
: FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
: IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
: OF THE BEN/D3-0, COMPUTE THE VALUE OF
: Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
: RETURN2, OTHERWISE RETURN1 WILL BE USED
:
:
=0
DPT22: SUBTEST
      NOP
=0      ERLOOP

```

U 10F1, 0F18,0038,1180,09E8,0000,10F2 :2483
U 10F2, 0000,003D,0180,0800,0000,101B :2484
U 10F3, 0000,003C,01E0,0800,0000,10F8 :2485
U 10F8, 0000,003D,0180,0800,0000,1014 :2486
U 10F9, 0000,003C,0180,0800,0000,1050 :2487
U 1050, 0000,193D,0180,0800,0000,1020 :2488
U 1051, 0001,203D,0180,09F0,0000,1124 :2489
U 1052, 0000,003C,0180,0800,0000,10FA :2490

=0 D 0,RC[0D],K[.4]
CALL,J/DCB : D=0B
Q D : Q=0B
=0 CALL,J/DC4 : D<03:00>=4
NOP
=00 CALL,D3-0?,J/BRTBLE : TEST INSTRUCTION
ERROR1,RC[0E],Q
NOP

=
:////////////////////

:+
: SUBTEST 5
: TEST BEN D-0, WITH D<03:00>=8
: NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
: FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
: IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
: OF THE BEN/D3-0, COMPUTE THE VALUE OF
: Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
: RETURN2, OTHERWISE RETURN1 WILL BE USED

: -

=0

DPT23: SUBTEST

NOP

=0 ERLOOP

D 0,RC[0D],K[.8]

=0 CALL,J/DC7

: D=07

Q D

: Q=07

=0 CALL,J/DC8

: D<03:00>=8

NOP

=00 CALL,D3-0?,J/BRTBLE

: TEST INSTRUCTION

ERROR1,RC[0E],Q

NOP

=

U 10FA, 0000,003D,0180,0800,0000,1134 :2504
U 10FB, 0000,003C,0180,0800,0000,110A :2505
U 110A, 0000,003D,0180,0800,0000,111E :2506
U 110B, 0F18,0038,0180,09E8,0000,1110 :2507
U 1110, 0000,003D,0180,0800,0000,1017 :2508
U 1111, 0000,003C,01E0,0800,0000,1112 :2509
U 1112, 0000,003D,0180,0800,0000,1018 :2510
U 1113, 0000,003C,0180,0800,0000,1070 :2511
U 1070, 0000,193D,0180,0800,0000,1020 :2512
U 1071, 0001,203D,0180,09F0,0000,1124 :2513
U 1072, 0000,003C,0180,0800,0000,1118 :2514
:2515

U 1118.	0000,003D,0180,0800,0000,10CE	:2516
U 1119.	0018,0038,0580,09F8,0000,130D	:2517
U 130D.	0F18,0038,C180,0800,0000,130E	:2518
U 130E.	0500,003C,0380,0800,0000,130F	:2519
U 130F.	0501,0D3C,0180,09F0,0000,10CD	:2520
U 10CD.	0000,003D,0180,0800,0000,1124	:2521
U 10CF.	0501,0D3C,0180,09F0,0000,10D5	:2522
U 10D5.	0000,003D,0180,0800,0000,1124	:2523
U 10D7.	0501,0D3C,0180,09F0,0000,10DD	:2524
U 10DD.	0000,003D,0180,0800,0000,1124	:2525
U 10DF.	0501,0D3C,0180,09F0,0000,10E5	:2526
U 10E5.	0000,003D,0180,0800,0000,1124	:2527
U 10E7.	0501,0D3C,0180,09F0,0000,10ED	:2528
U 10ED.	0000,003D,0180,0800,0000,1124	:2529
U 10EF.	0501,0D3C,0180,09F0,0000,10F5	:2530
U 10F5.	0000,003D,0180,0800,0000,1124	:2531
U 10F7.	0501,0D3C,0180,09F0,0000,10FD	:2532
U 10FD.	0000,003D,0180,0800,0000,1124	:2533
U 10FF.	0501,0D3C,0180,09F0,0000,1115	:2534
U 1115.	0000,003D,0180,0800,0000,1124	:2535
U 1117.	0501,0D3C,0180,09F0,0000,111D	:2536
U 111D.	0000,003D,0180,0800,0000,1124	:2537
U 111F.	0501,0D3C,0180,09F0,0000,1125	:2538
U 1125.	0000,003D,0180,0800,0000,1124	:2539
U 1127.	0501,0D3C,0180,09F0,0000,112D	:2540
U 112D.	0000,003D,0180,0800,0000,1124	:2541
U 112F.	0501,0D3C,0180,09F0,0000,1135	:2542
U 1135.	0000,003D,0180,0800,0000,1124	:2543
U 1137.	0501,0D3C,0180,09F0,0000,113D	:2544
U 113D.	0000,003D,0180,0800,0000,1124	:2545
U 113F.	0501,0D3C,0180,09F0,0000,1145	:2546
U 1145.	0000,003D,0180,0800,0000,1124	:2547
U 1147.	0501,0D3C,0180,09F0,0000,114D	:2548
U 114D.	0000,003D,0180,0800,0000,1124	:2549
U 114F.	0501,0D3C,0180,09F0,0000,115D	:2550
U 115D.	0000,003D,0180,0800,0000,1124	:2551
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.PAGE      'TEST 44'      BEN/D.NE.0 TEST'
*****
++
TEST  44      BEN/D.NE.0 TEST

TEST DESCRIPTION
THIS IS A TEST OF THE D.NE.0 BRANCH ENABLE.
A 1 IS FLOATED ACCROSS A FIELD OF 0'S TO GENERATE
TEST DATA IN THE DREGISTER WITH WHICH THE BRANCH IS
TESTED.

LOGIC DESCRIPTION

ERROR DESCRIPTION
ACTUAL CONTENTS OF D REGISTER WHEN BRANCH ISSUED

--
=0
BDNEOT: NEWTST
        RC[OF] KC.1]
        D_0,ALO KC.FFFF]
        D_D.LEFT,SI/7      ; INITIALIZE D TO 1
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=1
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=2
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=4
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=8
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=10
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=20
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=40
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=80
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=100
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=200
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=400
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=800
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=1000
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=2000
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=4000
        D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
=101    ERROR1              ; D.NE.0? FAILED WITH D=8000

```

U 115F.	0501,0D3C,0180,09F0,0000,1165	:2571	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 1165.	0000,003D,0180,0800,0000,1124	:2572	ERROR1	D.NE.O? FAILED WITH D=10000
U 1167.	0501,0D3C,0180,09F0,0000,116D	:2573	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 116D.	0000,003D,0180,0800,0000,1124	:2574	ERROR1	D.NE.O? FAILED WITH D=20000
U 116F.	0501,0D3C,0180,09F0,0000,1175	:2575	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 1175.	0000,003D,0180,0800,0000,1124	:2576	ERROR1	D.NE.O? FAILED WITH D=40000
U 1177.	0501,0D3C,0180,09F0,0000,117D	:2577	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 117D.	0000,003D,0180,0800,0000,1124	:2578	ERROR1	D.NE.O? FAILED WITH D=80000
U 117F.	0501,0D3C,0180,09F0,0000,1185	:2579	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 1185.	0000,003D,0180,0800,0000,1124	:2580	ERROR1	D.NE.O? FAILED WITH D=100000
U 1187.	0501,0D3C,0180,09F0,0000,118D	:2581	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 118D.	0000,003D,0180,0800,0000,1124	:2582	ERROR1	D.NE.O? FAILED WITH D=200000
U 118F.	0501,0D3C,0180,09F0,0000,1195	:2583	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 1195.	0000,003D,0180,0800,0000,1124	:2584	ERROR1	D.NE.O? FAILED WITH D=400000
U 1197.	0501,0D3C,0180,09F0,0000,119D	:2585	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 119D.	0000,003D,0180,0800,0000,1124	:2586	ERROR1	D.NE.O? FAILED WITH D=800000
U 119F.	0501,0D3C,0180,09F0,0000,11A5	:2587	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11A5.	0000,003D,0180,0800,0000,1124	:2588	ERROR1	D.NE.O? FAILED WITH D=1000000
U 11A7.	0501,0D3C,0180,09F0,0000,11AD	:2589	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11AD.	0000,003D,0180,0800,0000,1124	:2590	ERROR1	D.NE.O? FAILED WITH D=2000000
U 11AF.	0501,0D3C,0180,09F0,0000,11B5	:2591	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11B5.	0000,003D,0180,0800,0000,1124	:2592	ERROR1	D.NE.O? FAILED WITH D=4000000
U 11B7.	0501,0D3C,0180,09F0,0000,11BD	:2593	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11BD.	0000,003D,0180,0800,0000,1124	:2594	ERROR1	D.NE.O? FAILED WITH D=8000000
U 11BF.	0501,0D3C,0180,09F0,0000,11C5	:2595	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11C5.	0000,003D,0180,0800,0000,1124	:2596	ERROR1	D.NE.O? FAILED WITH D=10000000
U 11C7.	0501,0D3C,0180,09F0,0000,11CD	:2597	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11CD.	0000,003D,0180,0800,0000,1124	:2598	ERROR1	D.NE.O? FAILED WITH D=20000000
U 11CF.	0501,0D3C,0180,09F0,0000,11D5	:2599	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11D5.	0000,003D,0180,0800,0000,1124	:2600	ERROR1	D.NE.O? FAILED WITH D=40000000
U 11D7.	0501,0D3C,0180,09F0,0000,11DD	:2601	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11DD.	0000,003D,0180,0800,0000,1124	:2602	ERROR1	D.NE.O? FAILED WITH D=80000000
U 11DF.	0501,0D3C,0180,09F0,0000,11E5	:2603	D.NE.O?,RC[OE]_D,D_D.LEFT,SI/ZERO	
U 11E5.	0000,003D,0180,0800,0000,1310	:2604	J/DNEOTD	
U 11E7.	0000,003D,0180,0800,0000,1124	:2605	ERROR1	D.NE.O? FAILED WITH D=00000000
U 1310.	0000,003C,0180,0800,0000,111A	:2606	DNEOTD: NOP	

U 111A, 0000,003D,0180,0800,0000,10CE
U 111B, 0018,0038,0D80,09F8,0000,1120

U 1120, 0000,003D,0180,0800,0000,1134
U 1121, 0000,003C,0180,0800,0000,1122
U 1122, 0000,003D,0180,0800,0000,111E
U 1123, 001B,0000,05C0,0800,0000,1311
U 1311, 0000,003C,01F8,0800,0000,1312
U 1312, 0001,203C,0180,09E8,0010,1313
U 1313, 0003,013C,0180,09F0,0000,1128
U 1128, 0003,003D,0180,09E0,0000,1124
U 1129, 0000,0D3C,0180,0800,0000,1153
U 1153, 0000,003C,0180,0800,0000,112A
U 1157, 0018,0039,0580,09E0,0000,1124

```
.PAGE "TEST 45 MISCELLANEOUS Q REGISTER FUNCTIONS TEST"
*****
++
TEST 45 MISCELLANEOUS Q REGISTER FUNCTIONS TEST

TEST DESCRIPTION
THIS IS A TEST OF LEFT AND RIGHT SHIFTS DONE SINGLE
AND DOUBLE BIT POSITIONS IN THE Q REGISTER. ALSO TESTED
ARE VARIOUS SHIFT INPUT VALUES AND BRANCH ENABLES
WHICH ARE Q DEPENDENT.

LOGIC DESCRIPTION
THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
THE UQK FIELD DECODE IS ON DAP. THIS IS THE CONTROL
LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
ARE BIT SLICED SUCH THAT:
      BITS <07:00> ARE ON DCP
      BITS <15:08> ARE ON DDP
      BITS <31:16> ARE ON DEP
THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.

ERROR DESCRIPTION
EXPECTED Q REGISTER
ACTUAL RESULT
ERROR CODE (SUBTEST 1 ONLY):
      0=>Q 0 FAILED
      1=>BEN/D (Q31?) FAILED

--
*****
=0
QREG: NEWTST
      RC[0F] K[.3]
://////////7//////////
+
SUBTEST 1
: Q_0 AND BEN Q<31> TEST WITH Q<31>=0
-
=0
DPT24: SUBTEST
      NOP
=0      ERLOOP
      ALU_0-K[.1],Q_ALU
      Q_0
      RC[0D] Q,CLK.UBCC
      Z?,RC[0E] 0
=0      ERROR1,RC[0C]_0 ;Q 0 FAILED
      Q31? ; BEN Q<31>
=011 J/DPT25
      ERROR1,RC[0C] K[.1] ; BEN Q<31> FAILED.
://////////7//////////
```


U 112A, 0000,003D,0180,0800,0000,1134
U 112B, 0000,003C,0180,0800,0000,1130
U 1130, 0000,003D,0980,0800,0084,713C
U 1131, 0000,003C,0180,0800,0000,1132
U 1132, 0000,003D,0180,0800,0000,111E
U 1133, 0F18,0038,C180,0800,0000,1314
U 1314, 0600,003C,0380,0800,0000,1315
U 1315, 0001,003C,01E0,09F0,0000,1316
U 1316, 0000,0D3C,0180,0800,0000,11EB
U 11EB, 0001,203D,0180,09E8,0000,1124
U 11EF, 0000,003C,0180,0800,0000,1138

U 1138, 0000,003D,0180,0800,0000,1134
U 1139, 0000,003C,0180,0800,0000,113A
U 113A, 0000,003D,0180,0800,0000,111E
U 113B, 0F00,003C,0180,0800,0000,1317
U 1317, 0001,003C,0180,09F0,0000,1318
U 1318, 0000,003C,01F8,0800,0000,1319
U 1319, 0000,003C,0180,0800,0000,131A
U 131A, 001D,2000,0180,0800,0010,131B
U 131B, 0000,013C,0180,0800,0000,1140
U 1140, 0001,203D,0180,09E8,0000,1124
U 1141, 0000,003C,0180,0800,0000,1142

U 1142, 0000,003D,0180,0800,0000,1134
U 1143, 0000,003C,0180,0800,0000,1148
U 1148, 0000,003D,0180,0800,0000,111E
U 1149, 0F18,0038,C180,0800,0000,131C
U 131C, 0600,003C,0380,0800,0000,131D
U 131D, 0001,003C,0180,09F0,0000,131E
U 131E, 0000,003C,01F8,0800,0000,131F
U 131F, 0000,003C,0380,0800,0000,1320
U 1320, 001D,2000,0180,0800,0010,1321
U 1321, 0000,013C,0180,0800,0000,114A
U 114A, 0001,203D,0180,09E8,0000,1124
U 114B, 0000,003C,0180,0800,0000,1150

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:2662
:2663 :+
:2664 : SUBTEST 2
:2665 : BEN Q<31>, WITH Q<31>=1
:2666
:2667 DPT25: SUBTEST
:2668 NOP
:2669 =0 SETRCF[.2]
:2670 NOP
:2671 =0 ERLOOP
:2672 D_0,ALU,K[.FFFF]
:2673 D_D,RIGHT,SI/7 : D=80000000
:2674 Q_D,RC[OE]_D : D=80000000
:2675 Q31? : BEN Q<31>
:2676 =011 ERROR1,RC[OD]_Q
:2677 NOP
:2678 :////////////////////
:2679 :+
:2680 : SUBTEST 3
:2681 : RIGHT SHIFT Q, INSERT 0 (UQK=6) (SI=3)
:2682 : USE D REG FUNCTIONS TO GENERATE EXPECTED
:2683 : DATA AND THE ALU TO CMP RESULT WITH EXPECTED
:2684 : RESULT.
:2685
:2686 =0
:2687 DPT26: SUBTEST
:2688 NOP
:2689 =0 ERLOOP
:2690 D_0
:2691 RC[OE]_D : SAVE EXPECTED DATA
:2692 D_0
:2693 Q-Q,RIGHT,SI/ZERO
:2694 A[U_Q-D,CLK,UBCC
:2695 Z?
:2696 =0 ERROR1,RC[OD]_Q : SINGLE LEFT SHIFT Q, 0 INPUT, FAILED.
:2697 NOP
:2698 :////////////////////
:2699 :+
:2700 : SUBTEST 4
:2701 : RIGHT SHIFT Q, INSERT 1, TEST (UQK=6) (SI=7)
:2702
:2703 =0
:2704 DPT27: SUBTEST
:2705 NOP
:2706 =0 ERLOOP
:2707 D_0,ALU,K[.FFFF]
:2708 D_D,RIGHT,SI/7 : GENERATE AND SAVE THE
:2709 RC[OE]_D : EXPECTED RESULT. D=80000000
:2710 Q_0
:2711 Q-Q,RIGHT,SI/7 : Q=80000000.TEST INSTRUCTION.
:2712 A[U_Q-D,CLK,UBCC
:2713 Z? : CHECK THE RESULT
:2714 =0 ERROR1,RC[OD]_Q
:2715 NOP
:2716 :////////////////////

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:2717 :+
:2718 : SUBTEST 5
:2719 : DOUBLE RIGHT SHIFT Q, INPUT 1, TEST UQK=2 AND USI=7
:2720 :-
:2721 : =0
:2722 DPT28: SUBTEST
:2723 : NOP
:2724 : =0 ERLOOP
:2725 : D_0,ALU_K[.FFFF]
:2726 : D-D.RIGHT2,SI/7 : COMPUTE AND SAVE THE
:2727 : RC[OE]_D : EXPECTED RESULT.D=0C0000000
:2728 : Q_0
:2729 : Q-Q.RIGHT2,SI/7 : Q=0C0000000.TEST INSTRUCTION.
:2730 : A[U_Q-D,CLK.UBCC
:2731 : Z? : CHECK THE RESULT
:2732 : =0 ERROR1,RC[OD]_Q
:2733 : NOP
:2734 : ///////////////////////////////////////////////////
:2735 :+
:2736 : SUBTEST 6
:2737 : SINGLE LEFT SHIFT Q, INSERT 0, TEST (UQK=5) (SI=3)
:2738 :-
:2739 : =0
:2740 DPT29: SUBTEST
:2741 : NOP
:2742 : =0 ERLOOP
:2743 : D_0
:2744 : RC[OE]_D : GENERATE AND SAVE THE
:2745 : : EXPECTED RESULT. D=0
:2746 : Q_0
:2747 : Q-Q.LEFT,SI/ZERO : Q=0
:2748 : A[U_Q-D,CLK.UBCC
:2749 : Z?
:2750 : =0 ERROR1,RC[OD]_Q
:2751 : NOP
:2752 : ///////////////////////////////////////////////////
:2753 :+
:2754 : SUBTEST 7
:2755 : SINGLE LEFT SHIFT Q,INSERT 1, TEST (UQK=5) (SI=7)
:2756 :-
:2757 : =0
:2758 DPT30: SUBTEST
:2759 : NOP
:2760 : =0 ERLOOP
:2761 : D_0,ALU_K[.FFFF]
:2762 : D-D.LEFT,SI/7 : GENERATE AND SAVE EXPECTED
:2763 : RC[OE]_D : RESULT. D=1
:2764 : Q_0
:2765 : Q-Q.LEFT,SI/7 : Q=1.TEST INSTRUCTION
:2766 : A[U_Q-D,CLK.UBCC
:2767 : Z? : CHECK THE RESULT
:2768 : =0 ERROR1,RC[OD]_Q
:2769 : NOP
:2770 : ///////////////////////////////////////////////////
:2771 :+

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U 1150, 0000,003D,0180,0800,0000,1134
U 1151, 0000,003C,0180,0800,0000,1158
U 1158, 0000,003D,0180,0800,0000,111E
U 1159, 0F18,0038,C180,0800,0000,1322
U 1322, 0200,003C,0380,0800,0000,1323
U 1323, 0001,003C,0180,09F0,0000,1324
U 1324, 0000,003C,01F8,0800,0000,1325
U 1325, 0000,003C,0390,0800,0000,1326
U 1326, 001D,2000,0180,0800,0010,1327
U 1327, 0000,013C,0180,0800,0000,115A
U 115A, 0001,203D,0180,09E8,0000,1124
U 115B, 0000,003C,0180,0800,0000,1160

U 1160, 0000,003D,0180,0800,0000,1134
U 1161, 0000,003C,0180,0800,0000,1162
U 1162, 0000,003D,0180,0800,0000,111E
U 1163, 0F00,003C,0180,0800,0000,1328
U 1328, 0001,003C,0180,09F0,0000,1329

U 1329, 0000,003C,01F8,0800,0000,132A
U 132A, 0000,003C,01A8,0800,0000,132B
U 132B, 001D,2000,0180,0800,0010,132C
U 132C, 0000,013C,0180,0800,0000,1168
U 1168, 0001,203D,0180,09E8,0000,1124
U 1169, 0000,003C,0180,0800,0000,116A

U 116A, 0000,003D,0180,0800,0000,1134
U 116B, 0000,003C,0180,0800,0000,1170
U 1170, 0000,003D,0180,0800,0000,111E
U 1171, 0F18,0038,C180,0800,0000,132D
U 132D, 0500,003C,0380,0800,0000,132E
U 132E, 0001,003C,0180,09F0,0000,132F
U 132F, 0000,003C,01F8,0800,0000,1330
U 1330, 0000,003C,03A8,0800,0000,1331
U 1331, 001D,2000,0180,0800,0010,1332
U 1332, 0000,013C,0180,0800,0000,1172
U 1172, 0001,203D,0180,09E8,0000,1124
U 1173, 0000,003C,0180,0800,0000,1178

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:2772 : SUBTEST 8
:2773 : DOUBLE LEFT SHIFT Q, INSERT 1, TEST (UQK=1) (SI=7)
:2774 :
:2775 =0
U 1178, 0000,003D,0180,0800,0000,1134 :2776 DPT31: SUBTEST
U 1179, 0000,003C,0180,0800,0000,117A :2777 NOP
U 117A, 0000,003D,0180,0800,0000,111E :2778 =0 ERLOOP
U 117B, 0F18,0038,C180,0800,0000,1333 :2779 D_0,ALU,K[FFFF]
U 1333, 0100,003C,0380,0800,0000,1334 :2780 D_D.LEFT2,SI/7 ; GENERATE AND SAVE EXPECTED
U 1334, 0001,003C,0180,09F0,0000,1335 :2781 RC[OE]_D ; RESULT. D=3
U 1335, 0000,003C,01F8,0800,0000,1336 :2782 Q_0
U 1336, 0000,003C,0388,0800,0000,1337 :2783 Q_Q.LEFT2,SI/7 ; Q=3. TEST INSTRUCTION.
U 1337, 001D,2000,0180,0800,0010,1338 :2784 ACU_Q-D,CLK.UBCC
U 1338, 0000,013C,0180,0800,0000,1182 :2785 Z? ; CHECK THE RESULT
U 1182, 0001,203D,0180,09E8,0000,1124 :2786 =0 ERROR1,RC[OD]_Q
U 1183, 0000,003C,0180,0800,0000,1188 :2787 NOP
:2788 :
:2789 :
:2790 : SUBTEST 9
:2791 : DOUBLE RIGHT SHIFT Q, INSERT 0'S, TEST (UQK=2) (SI=3)
:2792 :
:2793 =0
U 1188, 0000,003D,0180,0800,0000,1134 :2794 DPT32: SUBTEST
U 1189, 0000,003C,0180,0800,0000,118A :2795 NOP
U 118A, 0000,003D,0180,0800,0000,111E :2796 =0 ERLOOP
U 118B, 0F18,0038,C180,0800,0000,1339 :2797 D_0,ALU,K[FFFF]
U 1339, 0600,003C,0380,0800,0000,133A :2798 D_D.RIGHT,SI/7
U 133A, 0200,003C,0180,0800,0000,133B :2799 D_D.RIGHT2,SI/ZERO ; D=20000000
U 133B, 0001,003C,0180,09F0,0000,133C :2800 RC[OE]_D ; EXPECTED RESULT. D=20000000
:2801
U 133C, 0000,003C,01F8,0800,0000,133D :2802 Q_0
U 133D, 0000,003C,0380,0800,0000,133E :2803 Q_Q.RIGHT,SI/7
U 133E, 0000,003C,0190,0800,0000,133F :2804 Q_Q.RIGHT2,SI/ZERO ; Q=20000000
U 133F, 001D,2000,0180,0800,0010,1340 :2805 ACU_Q-D,CLK.UBCC
U 1340, 0000,013C,0180,0800,0000,1190 :2806 Z? ; CHECK THE RESULT.
U 1190, 0001,203D,0180,09E8,0000,1124 :2807 =0 ERROR1,RC[OD]_Q
U 1191, 0000,003C,0180,0800,0000,1192 :2808 NOP
:2809 :
:2810 :
:2811 : SUBTEST A
:2812 : DOUBLE LEFT SHIFT Q, INSERT 0'S, TEST (UQK=1) (USI=3)
:2813 :
:2814 =0
U 1192, 0000,003D,0180,0800,0000,1134 :2815 DPT33: SUBTEST
U 1193, 0000,003C,0180,0800,0000,1198 :2816 NOP
U 1198, 0000,003D,0180,0800,0000,111E :2817 =0 ERLOOP
U 1199, 0F18,0038,C180,0800,0000,1341 :2818 D_0,ALU,K[FFFF]
U 1341, 0500,003C,0380,0800,0000,1342 :2819 D_D.LEFT,SI/7
U 1342, 0100,003C,0180,0800,0000,1343 :2820 D_D.LEFT2,SI/ZERO ; GENERATE AND SAVE THE
U 1343, 0001,003C,0180,09F0,0000,1344 :2821 RC[OE]_D ; EXPECTED RESULT. D=4
U 1344, 0000,003C,01F8,0800,0000,1345 :2822 Q_0
U 1345, 0000,003C,03A8,0800,0000,1346 :2823 Q_Q.LEFT,SI/7
U 1346, 0000,003C,0188,0800,0000,1347 :2824 Q_Q.LEFT2,SI/ZERO ; Q=4. TEST INSTRUCTION.
U 1347, 001D,2000,0180,0800,0010,1348 :2825 ACU_Q-D,CLK.UBCC
U 1348, 0000,013C,018C,0800,0000,119A :2826 Z? ; CHECK THE RESULT.
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      D 8
ZZ-ESKAH-V132 TEST 45 MISCELLANEOUS Q REGISTER FUNCTIONS TEST
ESKAH20.MCR          MICRO2 1M(01) 16-DEC-82 10:48:35 ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20
U 119A, 0001,203D,0180,09E8,0000,1124 ;2827 =0 ERROR1,RC[0D]_Q
U 119B, 0000,003C,0180,0800,0000,11A0 ;2828 NOP

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U 11A0, 0000,003D,0180,0800,0000,10CE
U 11A1, 0F00,003C,0180,0800,0000,11A8
U 11A8, 0000,003D,0180,0800,0000,1164
U 11A9, 0000,003C,0180,0800,0000,11AA
U 11AA, 0000,003D,0180,0800,0000,1164
U 11AB, 0000,003C,01E0,0800,0000,1349
U 1349, 0018,0038,C180,0800,0000,134A
U 134A, 0500,003C,0380,0800,0000,134B
U 134B, 0001,003C,0180,09F0,0000,134C
U 134C, 0018,0038,0980,09F8,0000,134D
U 134D, 0000,003C,03A8,0800,0000,134E
U 134E, 001D,2000,0180,0800,0010,134F
U 134F, 0000,013C,0180,0800,0000,1180
U 1180, 0001,203D,0180,09E8,0000,1124
U 1181, 0500,003C,0180,0800,0000,1350
U 1350, 0001,003C,0180,09F0,0000,1351
U 1351, 0000,003C,01A8,0800,0000,1352
U 1352, 001D,2000,0180,0800,0010,1353
U 1353, 0000,013C,0180,0800,0000,1182
U 1182, 0001,203D,0180,09E8,0000,1124
U 1183, 0018,0038,C180,0800,0000,1354
U 1354, 0500,003C,0380,0800,0000,1355
U 1355, 0001,003C,0180,09F0,0000,1356

```

.PAGE "TEST 46 LEFT SHIFT Q REGISTER TEST"
*****
++
TEST 46 LEFT SHIFT Q TEST

TEST DESCRIPTION
THIS IS A TEST OF THE Q REGISTER'S ABILITY TO SHIFT
LEFT SINGLE AND DOUBLE. NOTE THAT THE D REGISTER
IS USED TO COMPUTE THE EXPECTED RESULT. THE TEST
DATA PATTERN IS A SERIES OF ALTERNATING 1'S AND 0'S.

LOGIC DESCRIPTION
THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
THE UQK FIELD DECODE IS ON DAP. THIS IS THE CONTROL
LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
ARE BIT SLICED SUCH THAT:
      BITS <07:00> ARE ON DCP
      BITS <15:08> ARE ON DDP
      BITS <31:16> ARE ON DEP
THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT
-
*****
=0
DPT34: NEWTST
      D 0
      CALL,J/DCAAAA          ; D=0000AAAA
      NOP
      CALL,J/DCAAAA          ; D=0AAAAAAAAA
      Q D                     ; Q=0AAAAAAAAA
      ALU_K[FFFF]
      D D.LEFT,S1/7          ; D=55555555
      RC[OE]_D
      RC[OF]_K[2]            ; SAVE EXPECTED DATA
      Q Q.LEFT,S1/7          ; Q=55555555. TEST INSTRUCTION.
      ALU_Q-D,CLK.UBCC
      Z?                      ; CHECK RESULTS.
=0
      ERROR1,RC[OD]_Q
      D D.LEFT,S1/ZERO        ; D=0AAAAAAAAA
      RC[OE]_D                ; SAVE EXPECTED DATA.
      Q Q.LEFT,S1/ZERO        ; Q=0AAAAAAAAA.TEST INSTRUCTION.
      ALU_Q-D,CLK.UBCC
      Z?                      ; CHECK RESULTS
=0
      ERROR1,RC[OD]_Q
      ALU_K[FFFF]
      D D.LEFT,S1/7          ; D=055555555
      RC[OE]_D                ; SAVE EXPECTED DATA.

```


U 1356.	0000,003C,03A8,0800,0000,1357	:2884	Q Q.LEFT,SI/7	; Q=55555555
U 1357.	001D,2000,0180,0800,0010,1358	:2885	ALU_Q-D,CLK.UBCC	
U 1358.	0000,013C,0180,0800,0000,11B8	:2886	Z?	; CHECK RESULTS
U 11B8.	0001,203D,0180,09E8,0000,1124	:2887	ERROR1,RC[0D]_Q	
U 11B9.	0500,003C,0180,0800,0000,1359	:2888	D_D.LEFT,SI/ZERO	; D=0AAAAAAAA
U 1359.	0001,003C,0180,09F0,0000,135A	:2889	RC[0E] D	; SAVE EXPECTED DATA.
U 135A.	0000,003C,01A8,0800,0000,135B	:2890	Q Q.LEFT,SI/ZERO	; Q=0AAAAAAAA
U 135B.	001D,2000,0180,0800,0010,135C	:2891	ALU_Q-D,CLK.UBCC	
U 135C.	0000,013C,0180,0800,0000,11BA	:2892	Z?	; CHECK RESULTS
U 11BA.	0001,203D,0180,09E8,0000,1124	:2893	ERROR1,RC[0D]_Q	
U 11BB.	0018,0038,C180,0800,0000,135D	:2894	ALU_KC.FFFF]	
U 135D.	0100,003C,0380,0800,0000,135E	:2895	D_D.LEFT2,SI/7	
U 135E.	0001,003C,0180,09F0,0000,135F	:2896	RC[0E] D	
U 135F.	0000,003C,0388,0800,0000,1360	:2897	Q Q.LEFT2,SI/7	
U 1360.	001D,2000,0180,0800,0010,1361	:2898	ALU_Q-D,CLK.UBCC	
U 1361.	0000,013C,0180,0800,0000,11C0	:2899	Z?	
U 11C0.	0001,203D,0180,09E8,0000,1124	:2900	ERROR1,RC[0D]_Q	
U 11C1.	0100,003C,0180,0800,0000,1362	:2901	D_D.LEFT2,SI/ZERO	
U 1362.	0000,003C,0188,0800,0000,1363	:2902	Q-Q.LEFT2,SI/ZERO	
U 1363.	0001,003C,0180,09F0,0000,1364	:2903	RC[0E] D	
U 1364.	001D,2000,0180,0800,0010,1365	:2904	ALU_Q-D,CLK.UBCC	
U 1365.	0000,013C,0180,0800,0000,11C2	:2905	Z?	
U 11C2.	0001,203D,0180,09E8,0000,1124	:2906	ERROR1,RC[0D]_Q	
U 11C3.	0000,003C,0180,0800,0000,11C8	:2907	NOP	

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U 11C8, 0000,003D,0180,0800,0000,10CE
U 11C9, 0018,0038,0980,09F8,0000,11CA
U 11CA, 0F00,003D,0180,0800,0000,1164
U 11CB, 0000,003C,0180,0800,0000,11D0
U 11D0, 0000,003D,0180,0800,0000,1164
U 11D1, 0018,0038,C1E0,0800,0000,1366
U 1366, 0600,003C,0380,0800,0000,1367
U 1367, 0001,003C,0380,09F0,0000,1368
U 1368, 001D,2000,0180,0800,0010,1369
U 1369, 0000,013C,0180,0800,0000,11D2
U 11D2, 0001,203D,0180,09E8,0000,1124
U 11D3, 0600,003C,0180,0800,0000,136A
U 136A, 0001,003C,0180,09F0,0000,136B
U 136B, 0000,003C,0180,0800,0000,136C
U 136C, 001D,2000,0180,0800,0010,136D
U 136D, 0000,013C,0180,0800,0000,11D8
U 11D8, 0001,203D,0180,09E8,0000,1124
U 11D9, 0018,0038,C180,0800,0000,136E
U 136E, 0600,003C,0380,0800,0000,136F
U 136F, 0001,003C,0180,09F0,0000,1370
U 1370, 0000,003C,0380,0800,0000,1371
U 1371, 001D,2000,0180,0800,0010,1372
U 1372, 0000,013C,0180,0800,0000,11DA

```

.PAGE "TEST 47 RIGHT SHIFT Q REGISTER TEST"
*****
++
TEST 47 RIGHT SHIFT Q REGISTER TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ABILITY OF THE Q REGISTER
TO SHIFT RIGHT SINGLE AND DOUBLE. EXPECTED
RESULT ARE COMPUTED USING THE D REGISTER. TEST DATA CONSISTS
OF A PATTERN OF ALTERNATING 1'S AND 0'S.

LOGIC DESCRIPTION
THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
THE UQK FIELD DECODE IS ON DAP. THIS IS THE CONTROL
LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
ARE BIT SLICED SUCH THAT:
      BITS <07:00> ARE ON DCP
      BITS <15:08> ARE ON DDP
      BITS <31:16> ARE ON DEP
THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--
*****
=0
DPT35: NEWTST
      RC[0F] K[.2]
      D 0,CAL,J/DCAAAA      : D=0000AAAA
      NOP
      CALL,J/DCAAAA          : D=0AAAAAAAAA
      Q D,ALU K[.FFFF]       : Q=0AAAAAAAAA
      D D.RIGHT,SI/7         : D=55555555
      Q Q.RIGHT,SI/7,RC[0E]_D : Q=55555555
      ACU_Q-D,CLK.UBCC
      Z?                      : CHECK RESULT
=0
      ERROR1,RC[0D]_Q
      D D.RIGHT,SI/ZERO      : D=0AAAAAAAAA
      RC[0E] D               : SAVE EXPECTED RESULT
      Q Q.RIGHT,SI/ZERO      : Q=0AAAAAAAAA
      ACU_Q-D,CLK.UBCC
      Z?                      : CHECK RESULT
=0
      ERROR1,RC[0D]_Q
      ALU_K[.FFFF]
      D D.RIGHT,SI/7         : D=55555555
      RC[0E] D               : SAVE EXPECTED RESULT
      Q Q.RIGHT,SI/7         : Q=55555555
      ACU_Q-D,CLK.UBCC
      Z?                      : CHECK RESULT

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U 11DA,	0001,203D,0180,09E8,0000,1124	:2963	=0	ERROR1,RC[0D]_Q	
U 11DB,	0600,003C,0180,0800,0000,1373	:2964		D D.RIGHT,SI/ZERO	: D=0AAAAAAAA
U 1373,	0001,003C,0180,09F0,0000,1374	:2965		RC[0E] D	: SAVE EXPECTED RESULT
U 1374,	0000,003C,0180,0800,0000,1375	:2966		Q Q.RIGHT,SI/ZERO	: Q=0AAAAAAAA
U 1375,	001D,2000,0180,0800,0010,1376	:2967		ALU_Q-D,CLK.UBCC	
U 1376,	0000,013C,0180,0800,0000,11E0	:2968		Z?	: CHECK RESULT
U 11E0,	0001,203D,0180,09E8,0000,1124	:2969	=0	ERROR1,RC[0D]_Q	
U 11E1,	0200,003C,0180,0800,0000,1377	:2970		D D.RIGHT2,SI/ZERO	
U 1377,	0001,003C,0180,09F0,0000,1378	:2971		RC[0E] D	
U 1378,	0000,003C,0190,0800,0000,1379	:2972		Q Q.RIGHT2,SI/ZERO	
U 1379,	001D,2000,0180,0800,0010,137A	:2973		ALU_Q-D,CLK.UBCC	
U 137A,	0000,013C,0180,0800,0000,11E2	:2974		Z?	
U 11E2,	0001,203D,0180,09E8,0000,1124	:2975	=0	ERROR1,RC[0D]_Q	
U 11E3,	0018,0038,0180,0800,0000,137B	:2976		ALU_KC.FFFF	
U 137B,	0200,003C,0380,0800,0000,137C	:2977		D D.RIGHT2,SI/7	
U 137C,	0001,003C,0180,09F0,0000,137D	:2978		RC[0E] D	
U 137D,	0000,003C,0390,0800,0000,137E	:2979		Q Q.RIGHT2,SI/7	
U 137E,	001D,2000,0180,0800,0010,137F	:2980		ALU_Q-D,CLK.UBCC	
U 137F,	0000,013C,0180,0800,0000,11E8	:2981		Z?	
U 11E8,	0001,203D,0180,09E8,0000,1124	:2982	=0	ERROR1,RC[0D]_Q	
U 11E9,	0000,003C,0180,0800,0000,11EC	:2983		NOP	

U 11EC, 0000,003D,0180,0800,0000,10CE
U 11ED, 0000,003C,01F8,0800,0000,11F0
U 11F0, 0000,003D,0180,0800,0000,1044
U 11F1, 0018,0038,0D80,09F8,0000,11F2
U 11F2, 0000,003D,0180,0800,0000,11A6
U 11F3, 0000,003C,01E0,0800,0000,11F4
U 11F4, 0000,003D,0180,0800,0000,111E
U 11F5, 0C00,003C,0180,0800,0000,1380
U 1380, 0018,0038,05C0,0800,0000,1381
U 1381, 0001,003C,0180,09E0,0000,11F6
U 11F6, 0001,193D,0180,09E0,0000,1030
U 11F7, 0001,203C,0180,09F0,0000,11F8
U 11F8, 0000,193D,0180,0800,0000,1060
U 11F9, 001C,0000,0180,0800,0010,1382
U 1382, 0000,013C,0180,0800,0000,11FA
U 11FA, 0000,003D,01E0,09E8,0000,1124
U 11FB, 000D,2000,0180,0800,0010,1383
U 1383, 0000,013C,0180,0800,0000,11FC
U 11FC, 000C,0039,01E0,09E8,0000,1124
U 11FD, 0001,203C,0180,0800,0010,1384
U 1384, 0000,013C,0180,0800,0000,11FE
U 11FE, 0000,003C,01A8,0800,0000,1381
U 11FF, 0819,0014,0580,0800,0010,1385

```
2984 .PAGE "TEST 48 FLOAT 1 THROUGH 0'S IN RA AND RB REGISTERS TEST"
2985 *****
2986 **
2987 TEST 48 FLOATING 1 THROUGH 0'S TEST OF RA AND RB REGISTERS
2988
2989 TEST DESCRIPTION
2990 THIS TEST FLOATS A 1 ACROSS A FIELD OF 0'S
2991 IN EACH RA AND RB SCRATCH PAD.
2992
2993 LOGIC DESCRIPTION
2994 THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
2995 ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
2996 THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
2997 IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
2998 LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
2999 OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
3000 THE BITS ARE PARTITIONED THUS:
3001 BITS <07:00> ON DCP
3002 BITS <15:08> ON DDP
3003 BITS <31:16> ON DEP
3004 CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
3005 SHOULD IDENTIFY WHICH BIT SLICE FAILED.
3006
3007 ERROR DESCRIPTION
3008 EXPECTED DATA
3009 GOT DATA
3010 REGISTER ADDRESS IN LOW ORDER 4 BITS ONLY
3011
3012 --
3013 *****
3014 =0
3015 FL1RAB: NEWTST
3016 Q_0
3017 =0 CALL,J/RARB.Q ; CLEAR ALL RA AND RB
3018 RC[0F]_K[.3]
3019 =0 CALL,J7DC.NF ; SET UP COUNTER.
3020 FL1RAB1: Q_D
3021 =0 ERLOOP
3022 D_Q
3023 Q_K[.1] ; SET UP TEST PATTERN
3024 FL1RAB2: RC[0C]_D
3025 =0 RC[0C]_D,CALL,D3-0?,J/WRRARB ; WRITE TEST PATTERN
3026 RC[0E]_Q
3027 =0 CALL,D3-0?,J/LTCHAB ; READ TEST PATTERN
3028 ALU_LA[A-B]Q,CLK.UBCC
3029 Z? ; Q=LA?
3030 =0 Q_D,RC[0D]_LA,ERROR1
3031 ACU_Q[A-B]B,CLK.UBCC
3032 Z? ; Q=LB?
3033 =0 Q_D,RC[0D]_LB,ERROR1
3034 ACU_Q,CLK.UBCC
3035 Z? ; REGISTER, TESTED,Q=0?
3036 =0 Q_Q.LEFT,S1/ZERO,J/FL1RAB2 ; NO, SO GENERATE NEXT
3037 ; TEST PATTERN AND LOOP.
3038 D_D+K[.1],CLK.UBCC
```


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[illegible]

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3042 .PAGE "TEST 49 FLOAT 0 THROUGH 1'S IN RA AND RB REGISTERS TEST"
3043 *****
3044 ++
3045 TEST 49 FLOATING 0 THROUGH 1'S TEST OF RA AND RB REGISTERS
3046
3047 TEST DESCRIPTION
3048 THIS TEST FLOATS A 0 ACROSS A FIELD OF 1'S IN
3049 EACH RA AND RB SCRATCH PAD.
3050
3051 LOGIC DESCRIPTION
3052 THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
3053 ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
3054 THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
3055 IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
3056 LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
3057 OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
3058 THE BITS ARE PARTITIONED THUS:
3059 BITS <07:00> ON DCP
3060 BITS <15:08> ON DDP
3061 BITS <31:16> ON DEP
3062 CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
3063 SHOULD IDENTIFY WHICH BIT SLICE FAILED.
3064
3065 ERROR DESCRIPTION
3066 EXPECTED DATA
3067 GOT DATA
3068 REGISTER ADDRESS IN LOW ORDER FOUR BITS ONLY
3069
3070 --
3071 *****
3072 =0
3073 FLORAB: NEWTST
3074 Q_0
3075 Q-Q-K[.1]
3076 =0 CALL,J/RARB,Q ; SET ALL REGISTERS TO-1.
3077 RC[0F] K[.3]
3078 =0 CALL,J7DC,NF ; SET UP COUNTER
3079 FLORAB1: Q_D
3080 =0 ERLOOP
3081 D_Q
3082 Q_0
3083 Q-Q-K[.1]
3084 Q-Q-RIGHT,S1/ZERO ; SET UP TEST PATTERN
3085 FLORAB2: RC[0C] D
3086 =0 CALL,D3-0?,J/WRRARB ; WRITE TEST PATTERN
3087 RC[0E] Q
3088 =0 CALL,D3-0?,J/LTCHAB ; READ TEST PATTERN
3089 ALU_LA[A-B]Q,CLK.UBCC
3090 Z? ; Q=LA?
3091 =0 Q D,RC[0D] LA,ERROR1
3092 ACU_Q[A-B][B,CLK.UBCC
3093 Z? ; Q=LB?
3094 =0 Q D,RC[0D] LB,ERROR1
3095 ACU_Q+K[.1],CLK.UBCC
3096 Z? ; REG. TESTED, Q=-1?
  
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U 1202, 0000,003D,0180,0800,0000,10CE
U 1203, 0000,003C,01F8,0800,0000,1386
U 1386, 0019,2000,05C0,0800,0000,1204
U 1204, 0000,003D,0180,0800,0000,1044
U 1205, 0018,0038,0D80,09F8,0000,1206
U 1206, 0000,003D,0180,0800,0000,11A6
U 1207, 0000,003C,01E0,0800,0000,1208
U 1208, 0000,003D,0180,0800,0000,111E
U 1209, 0C00,003C,0180,0800,0000,1387
U 1387, 0000,003C,01F8,0800,0000,1388
U 1388, 0019,2000,05C0,0800,0000,1389
U 1389, 0000,003C,0180,0800,0000,138A
U 138A, 0001,003C,0180,09E0,0000,120A
U 120A, 0000,193D,0180,0800,0000,1030
U 120B, 0001,203C,0180,09F0,0000,120C
U 120C, 0000,193D,0180,0800,0000,1060
U 120D, 001C,0000,0180,0800,0010,138B
U 138B, 0000,013C,0180,0800,0000,120E
U 120E, 0000,003D,01E0,09E8,0000,1124
U 120F, 000D,2000,0180,0800,0010,138C
U 138C, 0000,013C,0180,0800,0000,1210
U 1210, 000C,0039,01E0,09E8,0000,1124
U 1211, 0019,2014,0580,0800,0010,138D
U 138D, 0000,013C,0180,0800,0000,1212
  
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U 1212, 0000,003C,03B0,0800,0000,138A	:3097	=0	Q_Q.RIGHT,S1/7,J/FLORAB2 ; NO, SO GENERATE NEXT
	:3098		; TEST PATTERN AND LOOP.
U 1213, 0819,0014,0580,0800,0010,138E	:3099		D_D+K[.1],CLK.UBCC
U 138E, 0000,013C,0180,0800,0000,1214	:3100		Z? ; ALL REGISTERS
	:3101		; TESTED?
U 1214, 0000,003C,0180,0800,0000,1207	:3102	=0	J/FLORAB1
U 1215, 0000,003C,0180,0800,0000,1216	:3103		NOP

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U 1216.	000G,003D,0180,0800,0000,10CE
U 1217.	0F00,003C,0180,0800,0000,1218
U 1218.	0000,193D,0180,0800,0000,1010
U 1219.	0000,003C,0180,0800,0000,121A
U 121A.	0000,193D,0180,0800,0000,1010
U 121B.	0000,003C,0180,0800,0000,121C
U 121C.	0000,193D,0180,0800,0000,1010
U 121D.	0000,003C,0180,0800,0000,121E
U 121E.	0000,193D,0180,0800,0000,1010
U 121F.	0000,003C,0180,0800,0000,1220
U 1220.	0000,193D,0180,0800,0000,1010
U 1221.	0000,003C,0180,0800,0000,1222
U 1222.	0000,193D,0180,0800,0000,1010
U 1223.	0000,003C,0180,0800,0000,1224
U 1224.	0000,193D,0180,0800,0000,1010
U 1225.	0000,003C,0180,0800,0000,1226


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U 1226. 0000,193D,0180,0800,0000,1010 :3159 =0 CALL,D3-0?,J/DC0
U 1227. 0000,003C,01E0,0800,0000,1228 :3160 Q D
U 1228. 0000,193D,0180,0800,0000,1030 :3161 =0 CALL,D3-0?,J/WRRARB ; GO WRITE THIS DATA INTO
                                     :3162 ; THE REGISTER ADDRESSED BY D<03:00>
U 1229. 0819,0014,0580,0800,0010,138F :3163 ALU_D+K[.1],D_ALU,CLK.UBCC ; WRITTEN ALL REGISTER?
U 138F. 0000,013C,0180,0800,0000,122A :3164 Z?
U 122A. 0000,003C,0180,0800,0000,1218 :3165 =0 J/RABD1A ; IF NOT CONTINUE.
U 122B. 0F00,003C,01F8,0800,0000,122C :3166 D 0,Q 0 ; NOW GO READ ALL REGISTER BACK.
U 122C. 0000,003D,0180,0800,0000,111E :3167 =0 ERLOOP
U 122D. 0C00,003C,0180,0800,0000,122E :3168 D_Q
                                     :3169 =0
U 122E. 0000,193D,0180,0800,0000,1010 :3170 RABD1B: CALL,D3-0?,J/DC0
U 122F. 0000,003C,0180,0800,0000,1230 :3171 NOP
U 1230. 0000,193D,0180,0800,0000,1010 :3172 =0 CALL,D3-0?,J/DC0
U 1231. 0000,003C,0180,0800,0000,1232 :3173 NOP
U 1232. 0000,193D,0180,0800,0000,1010 :3174 =0 CALL,D3-0?,J/DC0
U 1233. 0000,003C,0180,0800,0000,1234 :3175 NOP
U 1234. 0000,193D,0180,0800,0000,1010 :3176 =0 CALL,D3-0?,J/DC0
U 1235. 0000,003C,0180,0800,0000,1236 :3177 NOP
U 1236. 0000,193D,0180,0800,0000,1010 :3178 =0 CALL,D3-0?,J/DC0
U 1237. 0000,003C,0180,0800,0000,1238 :3179 NOP
U 1238. 0000,193D,0180,0800,0000,1010 :3180 =0 CALL,D3-0?,J/DC0
U 1239. 0000,003C,0180,0800,0000,123A :3181 NOP
U 123A. 0000,193D,0180,0800,0000,1010 :3182 =0 CALL,D3-0?,J/DC0
U 123B. 0000,003C,0180,0800,0000,123C :3183 NOP
U 123C. 0000,193D,0180,0800,0000,1010 :3184 =0 CALL,D3-0?,J/DC0
U 123D. 0000,003C,01E0,0800,0000,123E :3185 Q D
U 123E. 0000,193D,0180,0800,0000,1060 :3186 =0 CALL,D3-0?,J/LTCHAB ; READ THE REGISTER.
U 123F. 001C,0000,0180,0800,0010,1390 :3187 ALU_LA[A-B]Q,CLK.UBCC ; CORRECT?
U 1390. 0000,013C,0180,0800,0000,1240 :3188 Z?
U 1240. 0000,003C,0180,0800,0000,1391 :3189 =0 J/RABD1C
U 1241. 0000,003C,0180,0800,0000,1394 :3190 J/RABD1D
U 1391. 0018,0038,0980,09F8,0000,1392 :3191 RABD1C: RC[0F]_K[.2] ; REPORT ERROR
U 1392. 0001,203C,0180,09F0,0000,1393 :3192 RC[0E]_Q
U 1393. 0000,003D,0180,09E8,0000,1124 :3193 RC[0D]_LA,ERROR1 ; RA ADDRESSING FAILURE.
U 1394. 000D,2000,0180,0800,0010,1395 :3194 RABD1D: ALU_Q[A-B]LB,CLK.UBCC ; CHECK LB
U 1395. 0000,013C,0180,0800,0000,1242 :3195 Z?
U 1242. 0000,003C,0180,0800,0000,1396 :3196 =0 J/RABD1E
U 1243. 0000,003C,0180,0800,0000,1399 :3197 J/RABD1F
U 1396. 0018,0038,0980,09F8,0000,1397 :3198 RABD1E: RC[0F]_K[.2]
U 1397. 0001,203C,0180,09F0,0000,1398 :3199 RC[0E]_Q
U 1398. 000C,0039,0180,09E8,0000,1124 :3200 RC[0D]_LB,ERROR1 ; RB ADDRESSING FAILURE.
U 1399. 0819,0014,0580,0800,0010,139A :3201 RABD1F: ALU_D+R[.1],D_ALU,CLK.UBCC ; CHECKED ALL REGISTERS?
U 139A. 0000,013C,0180,0800,0000,1244 :3202 Z?
U 1244. 0000,003C,0180,0800,0000,122E :3203 =0 J/RABD1B ; IF NOT CONTINUE.
U 1245. 0000,003C,0180,0800,0000,1246 :3204 NOP
    
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3205 .PAGE "TEST 4B RA AND RB REGISTERS BACKWARD DUAL ADDRESSING TEST"
3206 *****
3207 **
3208 TEST 4B RA AND RB BACKWARD DUAL ADDRESSING TEST
3209
3210 TEST DESCRIPTION
3211 THIS TEST WRITES THE PATTERN:
3212 FFFFFFFF IN R[0F]
3213 EEEEEEEE IN R[0E]
3214 DDDDDDDD IN R[0D]
3215 CCCCCCCC IN R[0C]
3216 ETC. TO
3217 00000000 IN R[0]
3218 AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
3219 THE REGISTERS ARE WRITTEN IN THE BACKWARD, DECREMENTING THE ADDRESS,
3220 DIRECTION.
3221
3222 LOGIC DESCRIPTION
3223 THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
3224 ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
3225 THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
3226 IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
3227 LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
3228 OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
3229 THE BITS ARE PARTITIONED THUS:
3230 BITS <07:00> ON DCP
3231 BITS <15:08> ON DDP
3232 BITS <31:16> ON DEP
3233 CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
3234 SHOULD IDENTIFY WHICH BIT SLICE FAILED.
3235
3236 ERROR DESCRIPTION
3237 EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
3238 GOT DATA
3239
3240 --
3241 *****
3242 =0
3243 RABDA2: NEWTST
3244 D 0 ; INITIALIZE DATA AND REGISTER ADDRESS
3245 =0 CALL,J/DCF
3246 NOP
3247 =0
3248 RABD2A: CALL,D3-0?,J/DC0
3249 NOP
3250 =0 CALL,D3-0?,J/DC0
3251 NOP
3252 =0 CALL,D3-0?,J/DC0
3253 NOP
3254 =0 CALL,D3-0?,J/DC0
3255 NOP
3256 =0 CALL,D3-0?,J/DC0
3257 NOP
3258 =0 CALL,D3-0?,J/DC0
3259 NOP

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U 1256, 0000,193D,0180,0800,0000,1010 :3260 =0 CALL,D3-0?,J/DC0
U 1257, 0000,003C,0180,0800,0000,1258 :3261 NOP
U 1258, 0000,193D,0180,0800,0000,1010 :3262 =0 CALL,D3-0?,J/DC0
U 1259, 0000,003C,01E0,0800,0000,125A :3263 Q D
U 125A, 0000,193D,0180,0800,0000,1030 :3264 =0 CALL,D3-0?,J/WRRARB ; GO WRITE THIS DATA INTO
                                     :3265 ; THE REGISTER ADDRESSED BY D<03:00>
U 125B, 0001,003C,0180,0800,0010,139B :3266 ALU_D,CLK.UBCC ; WRITTEN ALL REGISTER?
U 139B, 0000,013C,0180,0800,0000,125C :3267 Z?
U 125C, 0819,0000,0580,0800,0000,124A :3268 =0 D-D-K[.1],J/RABD2A ; IF NOT CONTINUE.
U 125D, 0F00,003C,01F8,0800,0000,125E :3269 D-0,Q 0 ; NOW GO READ ALL REGISTER BACK.
U 125E, 0000,003D,0180,0800,0000,101F :3270 =0 CALL,J/DCF
U 125F, 0000,003C,01E0,0800,0000,1260 :3271 Q D
U 1260, 0000,003D,0180,0800,0000,111E :3272 =0 ERLOOP
U 1261, 0C00,003C,0180,0800,0000,1262 :3273 D_Q
                                     :3274 =0
U 1262, 0000,193D,0180,0800,0000,1010 :3275 RABD2B: CALL,D3-0?,J/DC0
U 1263, 0000,003C,0180,0800,0000,1264 :3276 NOP
U 1264, 0000,193D,0180,0800,0000,1010 :3277 =0 CALL,D3-0?,J/DC0
U 1265, 0000,003C,0180,0800,0000,1266 :3278 NOP
U 1266, 0000,193D,0180,0800,0000,1010 :3279 =0 CALL,D3-0?,J/DC0
U 1267, 0000,003C,0180,0800,0000,1268 :3280 NOP
U 1268, 0000,193D,0180,0800,0000,1010 :3281 =0 CALL,D3-0?,J/DC0
U 1269, 0000,003C,0180,0800,0000,126A :3282 NOP
U 126A, 0000,193D,0180,0800,0000,1010 :3283 =0 CALL,D3-0?,J/DC0
U 126B, 0000,003C,0180,0800,0000,126C :3284 NOP
U 126C, 0000,193D,0180,0800,0000,1010 :3285 =0 CALL,D3-0?,J/DC0
U 126D, 0000,003C,0180,0800,0000,126E :3286 NOP
U 126E, 0000,193D,0180,0800,0000,1010 :3287 =0 CALL,D3-0?,J/DC0
U 126F, 0000,003C,0180,0800,0000,1270 :3288 NOP
U 1270, 0000,193D,0180,0800,0000,1010 :3289 =0 CALL,D3-0?,J/DC0
U 1271, 0000,003C,01E0,0800,0000,1272 :3290 Q D
U 1272, 0000,193D,0180,0800,0000,1060 :3291 =0 CALL,D3-0?,J/LTCHAB ; READ THE REGISTER.
U 1273, 001C,0000,0180,0800,0010,139C :3292 ALU_LACA-B]Q,CLK.UBCC ; CORRECT?
U 139C, 0000,013C,0180,0800,0000,1274 :3293 Z?
U 1274, 0000,003C,0180,0800,0000,139D :3294 =0 J/RABD2C
U 1275, 0000,003C,0180,0800,0000,13A0 :3295 J/RABD2D
U 139D, 0018,0038,0980,09F8,0000,139E :3296 RABD2C: RC[OF]_K[.2] ; REPORT ERROR
U 139E, 0001,203C,0180,09F0,0000,139F :3297 RC[OE]_Q
U 139F, 0000,003D,0180,09E8,0000,1124 :3298 RC[OD]_LA,ERROR1 ; RA ADDRESSING FAILURE.
U 13A0, 000D,2000,0180,0800,0010,13A1 :3299 RABD2D: ALU_Q[A-B]LB,CLK.UBCC ; CHECK LB
U 13A1, 0000,013C,0180,0800,0000,1276 :3300 Z?
U 1276, 0000,003C,0180,0800,0000,13A2 :3301 =0 J/RABD2E
U 1277, 0000,003C,0180,0800,0000,13A5 :3302 J/RABD2F
U 13A2, 0018,0038,0980,09F8,0000,13A3 :3303 RABD2E: RC[OF]_K[.2]
U 13A3, 0001,203C,0180,09F0,0000,13A4 :3304 RC[OE]_Q
U 13A4, 000C,0039,0180,09E8,0000,1124 :3305 RC[OD]_LB,ERROR1 ; RB ADDRESSING FAILURE.
U 13A5, 0001,003C,0180,0800,0010,13A6 :3306 RABD2F: ALU_D,CLK.UBCC ; CHECKED ALL REGISTERS?
U 13A6, 0000,013C,0180,0800,0000,1278 :3307 Z?
U 1278, 0819,0000,0580,0800,0000,1262 :3308 =0 D-D-K[.1],J/RABD2B ; IF NOT CONTINUE.
U 1279, 0000,003C,0180,0800,0000,127A :3309 NOP

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.PAGE "TEST 4C GALLOP 1'S IN RA AND RB REGISTERS TEST"
*****
++
TEST 4C GALLOPING 1'S TEST IN RA AND RB REGISTERS

TEST DESCRIPTION
THIS TEST PERFORMS A GALLOPING 1'S TEST OF THE REGISTER
MEMORY CHIPS.
FIRST ALL MEMORY LOCATIONS (REGISTERS) ARE CLEARED
THEN R[0] IS SET TO FFFFFFFF. R[0] IS READ AND CHECKED,
R[1] IS READ AND CHECKED, R[0] IS READ AND CHECKED, R[2] IS
READ AND CHECKED, R[0] IS READ AND CHECKED, ..... R[0]
IS READ AND CHECK, AND R[0F] IS READ AND CHECKED.
AT THIS POINT R[0] IS SET TO 0, AND R[1] IS SET TO FFFFFFFF.
R[1] IS READ AND CHECKED, R[0] IS READ AND CHECK, R[2] IS READ
AND CHECKED, R[1] IS READ AND CHECKED, ETC. THIS IS DONE WITH
FFFFFFFF IN EACH REGISTER AND THE OTHER REGISTERS
CLEAR.

LOGIC DESCRIPTION
THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
THE BITS ARE PARTITIONED THUS:
      BITS <07:00> ON DCP
      BITS <15:08> ON DDP
      BITS <31:16> ON DEP
CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
SHOULD IDENTIFY WHICH BIT SLICE FAILED.
IF THIS TEST FAILS AND THE PREVIOUS REGISTER TESTS PASS
THERE IS A VERY HIGH PROBABILITY THAT THE REGISTER CHIPS
THEMSELVES ARE THE CAUSE

ERROR DESCRIPTION
DATA READ
ADDRESS FOR 1'S
ADDRESS OF 0'S
EXPECTED DATA

--
*****
=0
LABT1: NEWTST
      0 0
=0 CALL,J/RARB.0 ; FILL RA AND RB WITH 0'S
      D 0
=0 CALL,J/DC.NF ; PUT -OF IN D.
      RC[0F]_K[4]
=0
LABT1A: CALL,D3-0?,J/LTCHAB,RC[0B]_0 ; LATCH RA AND RB [D<3:0>]
      ALU LA,CLK.UBCC
      Z?,RC[0D]_D ; IS RA 0?
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U 127A, 0000,003D,0180,0800,0000,10CE
U 127B, 0000,003C,01F8,0800,0000,127C
U 127C, 0000,003D,0180,0800,0000,1044
U 127D, 0F00,003C,0180,0800,0000,127E
U 127E, 0000,003D,0180,0800,0000,11A6
U 127F, 0018,0038,1180,09F8,0000,1280

U 1280, 0003,193D,0180,09D8,0000,1060
U 1281, 0000,003C,0180,0800,0010,13A7
U 13A7, 0001,013C,0180,09E8,0000,1282


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U 1282, 0000,003D,0180,09F0,0000,1124 :3365 =0 ERROR1,RC[OE]_LA
U 1283, 000C,0038,0180,0800,0010,13A8 :3366 ALU_LB,CLK.UBCC
U 13A8, 0000,013C,0180,0800,0000,1284 :3367 Z? ; IS RB 0?
U 1284, 000C,0039,0180,09E0,0000,1124 :3368 =0 ERROR1,RC[OC]_LB
U 1285, 0000,003C,01F8,0800,0000,13A9 :3369 Q_0
U 13A9, 0019,2000,05C0,0800,0000,1286 :3370 Q-Q-K[.1] ; Q=-1.
U 1286, 0001,393D,0180,09D8,0000,1030 :3371 =0 CALL,D3-0?,J/WRRARB,RC[OB]_Q ; MAKE RA RB -1
U 1287, 0000,003C,01E0,0800,0000,1288 :3372 Q_D
U 1288, 0000,003D,0180,0800,0000,11A6 :3373 =0 CALL,J/DC.NF ; MAKE D=-OF
U 1289, 001D,2000,0180,0800,0010,13AA :3374 LABT1D: ALU_Q-D,CLK.UBCC
U 13AA, 0000,013C,0180,0800,0000,128A :3375 Z?
U 128A, 0C00,003C,01E0,0800,0000,128C :3376 =0 D_Q,Q_D,J/LABT1F
U 128B, 0000,003C,0180,0800,0000,13B1 :3377 J7LABT1M
:3378 =0
U 128C, 0000,193D,0180,0800,0000,1060 :3379 LABT1F: CALL,D3-0?,J/LTCHAB ; READ -1'S
U 128D, 0018,0014,0580,0800,0010,13AB :3380 ALU_LA+K[.1],CLK.UBCC
U 13AB, 0001,213C,0180,09E0,0000,128E :3381 Z?,RC[OC]_Q ; LA=-1?
U 128E, 0000,003D,0180,09F0,0000,1124 :3382 =0 ERROR1,RC[OE]_LA
U 128F, 000C,0000,0180,0800,0010,13AC :3383 ALU_LA[A-B]LB,CLK.JBCC
U 13AC, 0000,013C,0180,0800,0000,1290 :3384 Z? ; LB=-1?
U 1290, 000C,0039,0180,09F0,0000,1124 :3385 =0 ERROR1,RC[OE]_LB
U 1291, 0C03,003C,01E0,09D8,0000,1292 :3386 D_Q,Q_D,RC[OB]_Q ; EXCHANGE D AND Q.
U 1292, 0000,193D,0180,0800,0000,1060 :3387 =0 CALL,D3-0?,J/LTCHAB ; READ 0'S
U 1293, 0000,003C,0180,0800,0010,13AD :3388 ALU_LA,CLK.UBCC
U 13AD, 0000,013C,0180,0800,0000,1294 :3389 Z? ; LA=0?
U 1294, 0000,003D,0180,09F0,0000,1124 :3390 =0 ERROR1,RC[OE]_LA
U 1295, 000C,0038,0180,0800,0010,13AE :3391 ALU_LB,CLK.UBCC
U 13AE, 0000,013C,0180,0800,0000,1296 :3392 Z? ; LB=0?
U 1296, 000C,0039,0180,09F0,0000,1124 :3393 =0 ERROR1,RC[OE]_LB
U 1297, 0C1B,0000,05E0,09D8,0000,1298 :3394 D_Q,Q_D,ALU_Q-K[.1],RC[OB]_ALU ; EXCHANGE D AND Q
U 1298, 0000,193D,0180,0800,0000,1060 :3395 =0 CALL,D3-0?,J/LTCHAB ; READ -1'S
U 1299, 0018,0014,0580,0800,0010,13AF :3396 ALU_LA+K[.1],CLK.UBCC
U 13AF, 0000,013C,0180,0800,0000,129A :3397 Z? ; LA=-1?
U 129A, 0000,003D,0180,09F0,0000,1124 :3398 =0 ERROR1,RC[OE]_LA
U 129B, 000C,0000,0180,0800,0010,13B0 :3399 ALU_LA[A-B]LB,CLK.UBCC
U 13B0, 0000,013C,0180,0800,0000,129C :3400 Z? ; LB=-1?
U 129C, 000C,0039,0180,09F0,0000,1124 :3401 =0 ERROR1,RC[OE]_LB
U 129D, 0C00,003C,01E0,0800,0000,13B1 :3402 D_Q,Q_D
U 13B1, 0819,0014,0580,0800,0010,13B2 :3403 LABT1M: D-D+K[.1],CLK.UBCC
U 13B2, 0000,013C,0180,0800,0000,129E :3404 Z?
U 129E, 0000,003C,0180,0800,0000,1289 :3405 =0 J/LABT1D
U 129F, 0C00,003C,01F8,0800,0000,12A0 :3406 D_Q,Q_0
U 12A0, 0000,193D,0180,0800,0000,1030 :3407 =0 CALL,D3-0?,J/WRRARB
U 12A1, 0819,0014,0580,0800,0010,13B3 :3408 D_D+K[.1],CLK.UBCC
U 13B3, 0000,013C,0180,0800,0000,12A2 :3409 Z?
U 12A2, 0000,003C,0180,0800,0000,1280 :3410 =0 J/LABT1A
U 12A3, 0000,003C,0180,0800,0000,12A4 :3411 NOP

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U 12A4, 0000,003D,0180,0800,0000,10CE
U 12A5, 0000,003C,01F8,0800,0000,13B4
U 13B4, 0019,2000,05C0,0800,0000,12A6
U 12A6, 0000,003D,0180,0800,0000,1044
U 12A7, 0F00,003C,0180,0800,0000,12A8
U 12A8, 0000,003D,0180,0800,0000,11A6
U 12A9, 0018,0038,1180,09F8,0000,12AC
U 12AC, 001B,1901,0580,09D8,0000,1060
U 12AD, 0018,0014,0580,0800,0010,13B5
U 13B5, 0001,013C,0180,09E8,0000,12AE
U 12AE, 0000,003D,0180,09F0,0000,1124
U 12AF, 000C,0000,0180,0800,0010,13B6

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.PAGE "TEST 4D GALLOP 0'S IN RA AND RB REGISTERS TEST"
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TEST 4D GALLOPING 0'S TEST OF RA AND RB REGISTERS

TEST DESCRIPTION
THIS TEST PERFORMS A GALLOPING 0'S TEST OF THE REGISTER
MEMORY CHIPS. FIRST ALL THE REGISTERS ARE SET TO FFFFFFFF. THEN
0 IS WRITTEN INTO R[0], R[0] IS READ AND CHECKED, R[1]
IS READ AND CHECKED, R[0] IS READ AND CHECKED, R[2] IS READ AND
CHECKED, R[0] IS READ AND CHECKED, R[3] IS READ AND CHECKED, ETC.
THEN R[0] IS SET TO FFFFFFFF AND R[1] IS CLEARED, R[1] IS
READ AND CHECKED, R[0] IS READ AND CHECKED, R[1] IS READ
AND CHECKED, R[2] IS READ AND CHECKED, R[1] IS READ AND
CHECKED, R[3] IS READ AND CHECKED, ETC.

LOGIC DESCRIPTION
THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
THE BITS ARE PARTITIONED THUS:
      BITS <07:00> ON DCP
      BITS <15:08> ON DDP
      BITS <31:16> ON DEP
CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
SHOULD IDENTIFY WHICH BIT SLICE FAILED.
IF THIS TEST FAILS AND THE PREVIOUS REGISTER TESTS PASS
THERE IS A VERY HIGH PROBABILITY THAT THE REGISTER CHIPS
THEMSELVES ARE THE CAUSE

ERROR DESCRIPTION
DATA READ
ADDRESS FOR 0'S
ADDRESS OF 1'S
EXPECTED DATA
--
*****
=0
LABT2: NEWTST
      Q 0
      Q-Q-K[.1] : Q=-1
=0 CALL,J/RARB.Q : FILL RA AND RB WITH -1'S
      D 0
=0 CALL,J/DC.NF : PUT -OF IN D.
      RC[0F]_K[.4]
=0
LABT2A: CALL,D3-0?,J/LTCHAB,ALU_0-K[.1],RC[0B]_ALU
      : LATCH RA AND RB [D<3:0>]
      ALU_LA+K[.1],CLK.UBCC
      Z?,RC[0D] D : IS RA -1?
=0 ERROR1,RC[0E]_LA
      ALU_LA[A-B]LB,CLK.UBCC

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U 13B6, 0000,013C,0180,0800,0000,12B0 :3467 Z? : IS RB -1?
U 12B0, 000C,0039,0180,09F0,0000,1124 :3468 =0 ERROR1,RC[OE]_LB
U 12B1, 0003,003C,01F8,09D8,0000,12B2 :3469 Q_0,RC[OB]_0
U 12B2, 0000,193D,0180,0800,0000,1030 :3470 =0 CALL,D3-0?,J/WRRARB : MAKE RA AND RB 0
U 12B3, 0000,003C,01E0,0800,0000,12B4 :3471 Q_D
U 12B4, 0000,003D,0180,0800,0000,11A6 :3472 =0 CALL,J/DC.NF : MAKE D=-OF
U 12B5, 001D,2000,0180,0800,0010,13B7 :3473 LABT2D: ALU_Q-D,CLK.UBCC
U 13B7, 0000,013C,0180,0800,0000,12B6 :3474 Z?
U 12B6, 0C00,003C,01E0,0800,0000,12B8 :3475 =0 D_Q,Q_D,J/LABT2F
U 12B7, 0000,003C,0180,0800,0000,13BE :3476 J7LABT2M
:3477 =0
U 12B8, 0000,193D,0180,0800,0000,1060 :3478 LABT2F: CALL,D3-0?,J/LTCHAB : READ 0'S
U 12B9, 0000,003C,0180,0800,0010,13B8 :3479 ALU_LA,CLK.UBCC
U 13B8, 0001,213C,0180,09E0,0000,12BA :3480 Z?,RC[OC]_Q : LA=0?
U 12BA, 0000,003D,0180,09F0,0000,1124 :3481 =0 ERROR1,RC[OE]_LA
U 12BB, 000C,0038,0180,0800,0010,13B9 :3482 ALU_LB,CLK.UBCC
U 13B9, 0000,013C,0180,0800,0000,12BC :3483 Z? : LB=0?
U 12BC, 000C,0039,0180,09F0,0000,1124 :3484 =0 ERROR1,RC[OE]_LB
U 12BD, 0C1B,0000,05E0,09D8,0000,12BE :3485 D_Q,Q_D,ALU_Q-K[.1],RC[OB]_ALU
U 12BE, 0000,193D,0180,0800,0000,1060 :3486 =0 CALL,D3-0?,J/LTCHAB : READ -1'S
U 12BF, 0018,0014,0580,0800,0010,13BA :3487 ALU_LA+K[.1],CLK.UBCC
U 13BA, 0000,013C,0180,0800,0000,12C0 :3488 Z? : LA=-1?
U 12C0, 0000,003D,0180,09F0,0000,1124 :3489 =0 ERROR1,RC[OE]_LA
U 12C1, 000C,0000,0180,0800,0010,13BB :3490 ALU_LA[A-B]LB,CLK.UBCC
U 13BB, 0000,013C,0180,0800,0000,12C2 :3491 Z? : LB=-1?
U 12C2, 000C,0039,0180,09F0,0000,1124 :3492 =0 ERROR1,RC[OE]_LB
U 12C3, 0C03,003C,01E0,09D8,0000,12C4 :3493 D_Q,Q_D,RC[OB]_0
U 12C4, 0000,193D,0180,0800,0000,1060 :3494 =0 CALL,D3-0?,J/LTCHAB : READ 0'S
U 12C5, 0000,003C,0180,0800,0010,13BC :3495 ALU_LA,CLK.UBCC
U 13BC, 0000,013C,0180,0800,0000,12C6 :3496 Z? : LA=0?
U 12C6, 0000,003D,0180,09F0,0000,1124 :3497 =0 ERROR1,RC[OE]_LA
U 12C7, 000C,0038,0180,0800,0010,13BD :3498 ALU_LB,CLK.UBCC
U 13BD, 0000,013C,0180,0800,0000,12C8 :3499 Z?
U 12C8, 000C,0039,0180,09F0,0000,1124 :3500 =0 ERROR1,RC[OE]_LB
U 12C9, 0C00,003C,01E0,0800,0000,13BE :3501 D_Q,Q_D
U 13BE, 0819,0014,0580,0800,0010,13BF :3502 LABT2M: D_D+K[.1],CLK.UBCC
U 13BF, 0000,013C,0180,0800,0000,12CA :3503 Z?
U 12CA, 0000,003C,0180,0800,0000,12B5 :3504 =0 J/LABT2D
U 12CB, 0C00,003C,01E0,0800,0000,13C0 :3505 D_Q,Q_D
U 13C0, 0000,003C,01F8,0800,0000,13C1 :3506 Q_0
U 13C1, 0019,2000,05C0,0800,0000,12CC :3507 Q-Q-K[.1]
U 12CC, 0000,193D,0180,0800,0000,1030 :3508 =0 CALL,D3-0?,J/WRRARB
U 12CD, 0819,0014,0580,0800,0010,13C2 :3509 D_D+K[.1],CLK.UBCC
U 13C2, 0000,013C,0180,0800,0000,12CE :3510 Z?
U 12CE, 0000,003C,0180,0800,0000,12AC :3511 =0 J/LABT2A
U 12CF, 0000,003C,0180,0800,0000,13C3 :3512 NOP
:3513
:3514 :////////////////////
:3515 :+ THIS ROUTINE HAS NOTHING WHATSOEVER TO DO WITH THE ABOVE TEST.
:3516 : FIRST, THE SYSTEM ID REGISTER IS READ AND THE CONTENTS TYPE TO
:3517 : THE CONSOLE TERMINAL. THEN, A JUMP IS MADE TO LOCATION 85(X) IN
:3518 : PCS WHICH IS ECO'D TO BE EITHER 1180(X) IF THE KE780 OPTION IS
:3519 : NOT PRESENT OR 11A3(X) IF IT IS PRESENT.
:3520 :
:3521 :& 1,/SYSTEM ID REGISTER = /
```



```

:3522 :& 2./KE780 FPLA NOT PRESENT/
:3523 :& 3./KE780 FPLA PRESENT/
:3524 :-
U 13C3, 0000,003C,0DF0,2C00,0000,13C4 :3525 Q_ID[SYS.ID]
U 13C4, 0001,203C,0180,09F0,0000,12D0 :3526 RC[OE] Q
U 12D0, 0000,003D,0180,0800,0000,1146 :3527 =0 CALLED[DECFLG] ; DECREMENT THE TYPE OUT FLAG
U 12D1, 0000,003C,0180,0800,0000,12D2 :3528 NOP
U 12D2, 0818,0039,0580,0800,0000,11B6 :3529 =0 TYPE_MSG_1 ; "SYS ID REGISTER = "
U 12D3, 0000,003C,0180,0800,0000,12D4 :3530 NOP
U 12D4, 0000,003D,0180,0800,0000,1146 :3531 =0 CALLED[DECFLG] ; DECREMENT THE TYPEOUT FLAG
U 12D5, 0000,003C,0180,0800,0000,12D6 :3532 NOP
U 12D6, 0000,003D,0180,0800,0000,11D6 :3533 =0 TYP_RC[OE]_CRLF
:3534
U 12D7, 0000,003C,0180,0800,0000,12D8 :3535 NOP
U 12D8, 0000,003D,0980,0800,0084,713C :3536 =0 SETRCF[.2] ; SET NUMBER OF TYPEOUT ARGUMENTS
:3537
:3538 ; CHECK IF KE780 OPTION IS PRESENT
:3539
U 12D9, 0000,003C,0180,0800,0000,0085 :3540 J/85 ; SEE IF KE780 FPLA IS INSTALLED
U 1180, 0000,003D,0180,0800,0000,1146 :3541 1180: CALLED[DECFLG] ; DECREMENT TYPEOUT FLAG
U 1181, 0000,003C,0180,0800,0000,12DA :3542 1181: NOP
U 12DA, 0818,0039,0980,0800,0000,11DC :3543 =0 TYP_MSG_2_CRLF ; TELL OPERATOR KE780 IS NOT PRESENT
U 12DB, 0000,003C,0180,0800,0000,13CA :3544 J/ESKAH20_END
U 11A3, 0000,003C,0180,0800,0000,12DC :3545 11A3: NOP
U 12DC, 0000,003D,0180,0800,0000,1146 :3546 =0 CALLED[DECFLG] ; DECREMENT TYPEOUT FLAG
U 12DD, 0000,003C,0180,0800,0000,12DE :3547 NOP
U 12DE, 0818,0039,0D80,0800,0000,11DC :3548 =0 TYP_MSG_3_CRLF ; TELL OPERATOR KE780 IS PRESENT
:3549
:3550 ; NOW CHECK THAT THE SYSTEM ID REGISTER REFLECTS A PROPER ECO
:3551 ; LEVEL. THE ECO LEVEL MUST BE AT LEAST 70
:3552
U 12DF, 0000,003C,0DF0,2C00,0000,13C5 :3553 Q_ID[SYS.ID] ; GET SYSTEM ID REGISTER
U 13C5, 0C00,003C,6180,0800,0000,13C6 :3554 D-Q,K[.F] ; SETUP TO SHIFT ECO LEVEL FIELD
U 13C6, 001B,0000,6180,0800,0082,13C7 :3555 SC 0-K[.F]
U 13C7, 0D00,003C,0180,0800,0000,12E0 :3556 D_BAL.SC ; SHIFT TO BITS<8:0>
U 12E0, 0818,0039,8DE0,0800,0000,101F :3557 =0 Q-D,D,K[.1F],CALLED[DCF] ; GET A MASK
U 12E1, 001D,0034,01C0,09E8,0000,12E2 :3558 Q-D[AND]Q,RC[OD] ALU ; GET SYSTEM ECO LEVEL
U 12E2, 0818,0039,5D80,0800,0000,1010 :3559 =0 D-K[.7],CALLED[DCO] ; GET MINIMUM ECO LEVEL
U 12E3, 0001,003C,0180,09F0,0000,13C8 :3560 RC[OE] D ; SAVE FOR TYPEOUT
U 13C8, 001D,2000,0180,0800,0010,13C9 :3561 ALU-Q-D,CLK.UBCC ; IS ECO AT LEAST AT MINIMUM?
U 13C9, 0000,1B3C,0180,0800,0000,1047 :3562 ALU-N?
U 1047, 0000,003C,0180,0800,0000,13CA :3563 =0111 J/ESKAH20_END ; SYSTEM ECO LEVEL OK
U 104F, 0000,003C,0180,0800,0000,12E4 :3564 NOP
U 12E4, 0000,003D,0180,0800,0000,112C :3565 =0 ERROR2 ; SYSTEM ECO LEVEL TOO LOW
U 12E5, 0000,003C,0180,0800,0000,13CA :3566 NOP
:3567
:3568 ESKAH20_END:
U 13CA, 0000,003D,0180,0800,0000,10CE :3569 DUM: NEWTST

```


Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1872=	1839	1846=	1862=	1863=	1864=	1840	2089=
U 1008	2415=	2416=	2418=	1841	2017=	2018=	1842	2090=
U 1010	1959=	1960=	1961=	1962=	1963=	1964=	1965=	1966=
U 1018	1967=	1968=	1969=	1970=	1971=	1972=	1973=	1974=
U 1020	2000=	2001=	2002=	2003=	2004=	2005=	2006=	2007=
U 1028	2008=	2009=	2010=	2011=	2012=	2013=	2014=	2015=
U 1030	2021=	2022=	2023=	2024=	2025=	2026=	2027=	2028=
U 1038	2029=	2030=	2031=	2032=	2033=	2034=	2035=	2036=
U 1040	2440=	2441=	2442=	1843	2059=	2060=	1844	3563=
U 1048	2464=	2465=	2466=	1845	2062=	2063=	1901=	3564=
U 1050	2488=	2489=	2490=	1865	1866	2154=	1867	2155=
U 1058	2065=	2066=	1904=	1868	1869	2172=	1907=	2173=
U 1060	2040=	2041=	2042=	2043=	2044=	2045=	2046=	2047=
U 1068	2048=	2049=	2050=	2051=	2052=	2053=	2054=	2055=
U 1070	2512=	2513=	2514=	1870	2140=	2141=	2175=	2176=
U 1078	2148=	2149=	2150=	2151=	2165=	2166=	2202=	2203=
U 1080	2167=	2168=	2180=	2181=	2190=	2191=	2198=	2200=
U 1088	2192=	2193=	2213=	2214=	2215=	2216=	2218=	2219=
U 1090	2237=	2238=	2239=	2240=	2244=	2245=	2223=	2224=
U 1098	2248=	2249=	2257=	2258=	2259=	2260=	2228=	2229=
U 10A0	2264=	2266=	2270=	2272=	2276=	2277=	2311=	2312=
U 10A8	2299=	2300=	2304=	2305=	2306=	2307=	2314=	2315=
U 10B0	2349=	2350=	2353=	2354=	2355=	2357=	2317=	2318=
U 10B8	2362=	2363=	2364=	2366=	2371=	2372=	2320=	2321=
U 10C0	2393=	2394=	2408=	2409=	2410=	2411=	2323=	2324=
U 10C8	2412=	2413=	2432=	2433=	1871	2540=	1881	2541=
U 10D0	2434=	2435=	2436=	2437=	1882	2542=	1883	2543=
U 10D8	2438=	2439=	2456=	2457=	1884	2544=	1885	2545=
U 10E0	2458=	2459=	2460=	2461=	1886	2546=	1887	2547=
U 10E8	2462=	2463=	2480=	2481=	1888	2548=	1889	2549=
U 10F0	2482=	2483=	2484=	2485=	1890	2550=	1891	2551=
U 10F8	2486=	2487=	2504=	2505=	1892	2552=	1893	2553=
U 1100	1826=	1827=	1828=	1829=	1830=	1831=	1832=	1833=
U 1108	1834=	1894	2506=	2507=	1835=	1836=	1837=	1838=
U 1110	2508=	2509=	2510=	2511=	1895	2554=	1896	2555=
U 1118	2535=	2536=	2642=	2643=	1897	2556=	1898	2557=
U 1120	2650=	2651=	2652=	2653=	1899	2558=	1900	2559=
U 1128	2657=	2658=	2667=	2668=	1902	2560=	1903	2561=
U 1130	2669=	2670=	2671=	2672=	1935	2562=	1936	2563=
U 1138	2687=	2688=	2689=	2690=	1942	2564=	1943	2565=
U 1140	2696=	2697=	2704=	2705=	1944	2566=	1949	2567=
U 1148	2706=	2707=	2714=	2715=	1950	2568=	1951	2569=
U 1150	2722=	2723=	1954	2659=	1955	1927=	1956	2660=
U 1158	2724=	2725=	2732=	2733=	1957	2570=	1975	2571=
U 1160	2740=	2741=	2742=	2743=	1976	2572=	1977	2573=
U 1168	2750=	2751=	2758=	2759=	1978	2574=	1979	2575=
U 1170	2760=	2761=	2768=	2769=	1980	2576=	1981	2577=
U 1178	2776=	2777=	2778=	2779=	1982	2578=	1983	2579=
U 1180	3541=	3542=	2786=	2787=	1984	2580=	1985	2581=
U 1188	2794=	2795=	2796=	2797=	1986	2582=	1987	2583=
U 1190	2807=	2808=	2815=	2816=	1988	2584=	1989	2585=
U 1198	2817=	2818=	2827=	2828=	1990	2586=	1991	2587=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2861=	2862=	1992	3545:	1993	2588=	1994	2589=
U 11A8	2863=	2864=	2865=	2866=	1995	2590=	2016	2591=
U 11B0	2874=	2875=	2880=	2881=	2064	2592=	2081	2593=
U 11B8	2887=	2888=	2893=	2894=	2083	2594=	2084	2595=
U 11C0	2900=	2901=	2906=	2907=	2085	2596=	2086	2597=
U 11C8	2940=	2941=	2942=	2943=	2087	2598=	2088	2599=
U 11D0	2944=	2945=	2950=	2951=	2091	2600=	2094	2601=
U 11D8	2956=	2957=	2963=	2964=	2096	2602=	2097	2603=
U 11E0	2969=	2970=	2975=	2976=	2152	2604=	2169	2605=
U 11E8	2982=	2983=	2170	2676=	3015=	3016=	2171	2677=
U 11F0	3017=	3018=	3019=	3020=	3021=	3022=	3025=	3026=
U 11F8	3027=	3028=	3030=	3031=	3033=	3034=	3036=	3038=
U 1200	3040=	3041=	3073=	3074=	3076=	3077=	3078=	3079=
U 1208	3080=	3081=	3086=	3087=	3088=	3089=	3091=	3092=
U 1210	3094=	3095=	3097=	3099=	3102=	3103=	3142=	3143=
U 1218	3145=	3146=	3147=	3148=	3149=	3150=	3151=	3152=
U 1220	3153=	3154=	3155=	3156=	3157=	3158=	3159=	3160=
U 1228	3161=	3163=	3165=	3166=	3167=	3168=	3170=	3171=
U 1230	3172=	3173=	3174=	3175=	3176=	3177=	3178=	3179=
U 1238	3180=	3181=	3182=	3183=	3184=	3185=	3186=	3187=
U 1240	3189=	3190=	3196=	3197=	3203=	3204=	3243=	3244=
U 1248	3245=	3246=	3248=	3249=	3250=	3251=	3252=	3253=
U 1250	3254=	3255=	3256=	3257=	3258=	3259=	3260=	3261=
U 1258	3262=	3263=	3264=	3266=	3268=	3269=	3270=	3271=
U 1260	3272=	3273=	3275=	3276=	3277=	3278=	3279=	3280=
U 1268	3281=	3282=	3283=	3284=	3285=	3286=	3287=	3288=
U 1270	3289=	3290=	3291=	3292=	3294=	3295=	3301=	3302=
U 1278	3308=	3309=	3355=	3356=	3357=	3358=	3359=	3360=
U 1280	3362=	3363=	3365=	3366=	3368=	3369=	3371=	3372=
U 1288	3373=	3374=	3376=	3377=	3379=	3380=	3382=	3383=
U 1290	3385=	3386=	3387=	3388=	3390=	3391=	3393=	3394=
U 1298	3395=	3396=	3398=	3399=	3401=	3402=	3405=	3406=
U 12A0	3407=	3408=	3410=	3411=	3453=	3454=	3456=	3457=
U 12A8	3458=	3459=	1928:	2174	3461=	3463=	3465=	3466=
U 12B0	3468=	3469=	3470=	3471=	3472=	3473=	3475=	3476=
U 12B8	3478=	3479=	3481=	3482=	3484=	3485=	3486=	3487=
U 12C0	3489=	3490=	3492=	3493=	3494=	3495=	3497=	3498=
U 12C8	3500=	3501=	3504=	3505=	3508=	3509=	3511=	3512=
U 12D0	3527=	3528=	3529=	3530=	3531=	3532=	3533=	3535=
U 12D8	3536=	3540=	3543=	3544=	3546=	3547=	3548=	3553=
U 12E0	3557=	3558=	3559=	3560=	3565=	3566=	2178	2179
U 12E8	2194	2195	2196	2197	2201	2205	2217	2220
U 12F0	2221	2222	2225	2226	2227	2241	2242	2243
U 12F8	2246	2247	2261	2262	2263	2267	2268	2269
U 1300	2273	2274	2275	2308	2310	2313	2316	2319
U 1308	2322	2358	2369	2370	2414	2537	2538	2539
U 1310	2606	2654	2655	2656	2673	2674	2675	2691
U 1318	2692	2693	2694	2695	2708	2709	2710	2711
U 1320	2712	2713	2726	2727	2728	2729	2730	2731
U 1328	2744	2746	2747	2748	2749	2762	2763	2764
U 1330	2765	2766	2767	2780	2781	2782	2783	2784
U 1338	2785	2798	2799	2800	2802	2803	2804	2805
U 1340	2806	2819	2820	2821	2822	2823	2824	2825

;Location		0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348		2826	2867	2868	2869	2870	2871	2872	2873
U 1350		2876	2877	2878	2879	2882	2883	2884	2885
U 1358		2886	2889	2890	2891	2892	2895	2896	2897
U 1360		2898	2899	2902	2903	2904	2905	2946	2947
U 1368		2948	2949	2952	2953	2954	2955	2958	2959
U 1370		2960	2961	2962	2965	2966	2967	2968	2971
U 1378		2972	2973	2974	2977	2978	2979	2980	2981
U 1380		3023	3024	3029	3032	3035	3039	3075	3082
U 1388		3083	3084	3085	3090	3093	3096	3100	3164
U 1390		3188	3191	3192	3193	3194	3195	3198	3199
U 1398		3200	3201	3202	3267	3293	3296	3297	3298
U 13A0		3299	3300	3303	3304	3305	3306	3307	3364
U 13A8		3367	3370	3375	3381	3384	3389	3392	3397
U 13B0		3400	3403	3404	3409	3455	3464	3467	3474
U 13B8		3480	3483	3488	3491	3496	3499	3502	3503
U 13C0		3506	3507	3510	3525	3526	3554	3555	3556
U 13C8		3561	3562	3569					
U 13D0	- 13EF Unused								
U 13F0		1911:	1912:	1913:	1914:	1915:	1916:	1917:	1918:
U 13F8		1919:	1920:	1921:	1922:	1923:	1924:	1925:	1926:

ZZ-ESKAH-V132 Line Number Index
ESKAH20.MCR

MICRO2 1M(01)

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L 9

ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20

SEQ 0111

Page 9

Words not
in bounds

ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH20	987

Used 987
Remaining

Total microwords used in memory U: 987
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

CCCCCCCCCCCC

ZZ-ESKAH-V132 Line Number Index
ESKAH20.MCR

MICRO2 1M(01)

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ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20

SEQ 0112
Page 9

; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH20.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

ZZ-ESKAH-V132 Line Number Index
ESKAH20.MCR
MICRO2 1M(01)
16-DEC-82 10:48:35
M 9
ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20
SEQ 0112
Page 9
; The files used in this assembly are:
ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH20.MIC
Pass 1 warnings: 0 Pass 2 warnings: 0
Pass 1 errors: 0 Pass 2 errors: 0

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2040	TEST 4E FLOAT 1 THROUGH 0'S IN RC REGISTERS TEST
: 2099	TEST 4F FLOAT 0 THROUGH 1'S IN RC REGISTERS TEST
: 2160	TEST 50 RC REGISTERS FOREWARD DUAL ADDRESSING TEST
: 2255	TEST 51 RC REGISTERS BACKWARD DUAL ADDRESSING TEST
: 2354	TEST 52 GALLOP 1'S IN RC REGISTERS TEST
: 2454	TEST 53 GALLOP 0'S IN RC REGISTERS TEST
: 2555	TEST 54 NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST
: 2661	TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST
: 2776	TEST 56 TEST USI, SHIFT INPUT, USING THE Q REGISTER
: 3013	TEST 57 TEST USI, SHIFT INPUT, USING THE D REGISTER
: 3253	TEST 58 AMX TEST

ZZ-ESKAM-V132 Subroutines
ESKAM21.MCR

MICRO2 1M(01)

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B 10

SEQ 0114
Page

:1
:1804
:1805

.NOLIST
.LIST

```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,1004
U 1004, 0C00,003C,01E0,0800,0000,1006
U 1006, 0000,003C,8180,3C00,0000,100C
U 100C, 0C00,003C,01E0,0800,0000,100E
U 100E, 0000,003C,01C0,0A78,0000,104C
U 104C, 0001,2024,0180,0800,0010,105B
U 105B, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000
:1825
:1826
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:1860

```

```

      TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
REGION/1000,13FF
+
FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
TO THE CONSOLE.
-
1100: SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
1101: SC_K[.1],J/TRPH0       ; DATA UNALIGNED
1102: SC_K[.2],J/TRPH0       ; X PAGE ERROR
1103: SC_K[.3],J/TRPH0       ; TB MODIFY
1104: SC_K[.4],J/TRPH0       ; TB PROT ERROR
1105: SC_K[.6],J/TRPH0       ; TB MISS
1106: SC_K[.9],J/TRPH0       ; RES FLOAT OPER
1107: SC_K[.7],J/TRPH0       ; TB PARITY
1108: SC_K[.8],J/TRPH0       ; CACHE PARITY
110C: SC_K[.C],J/TRPH1       ; RDS
110D: SC_K[.D],J/TRPH1       ; TIME OUT
110E: SC_K[.10],J/TRPH0      ; ODD ADDRESS
110F: SC_K[.F],J/TRPH1      ; CS PARITY
TRPH0: Q_ID[USTACK]
      Q_D,D,Q
      ID[USTACK],D
      Q_D,D,Q
      Q-R[OF]
      ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
      Z?                               ; BRANCH IF NO
=0      ALU_Q.AND.MASK,R[OF],ALU,RETURN0 ; CLEAR THE BIT AND RETURN
+
THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

      DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER
      CACHE PARITY REGISTER
      TB ERROR REGISTER 1
      TB ERROR REGISTER 0
-

```


ZZ-ESKAM-V132 Subroutines
ESKAM21.MCR

MICRO2 1M(01)

16-DEC-82 10:51:29

U 1003, 0018,0038,1D80,09E8,0000,1008 :1861
 U 1008, 0000,003D,D980,0800,0084,7280 :1862
 U 1009, 0000,003C,49F0,2C00,0000,105C :1863
 U 105C, 0001,203C,4DF0,2DB0,0000,1064 :1864
 U 1064, 0001,203C,65F0,2DB8,0000,1066 :1865
 U 1066, 0001,203C,6DF0,2DD8,0000,106C :1866
 U 106C, 0001,203C,75F0,2DE0,0000,106E :1867
 U 106E, 0001,203C,79F0,2DC8,0000,1109 :1868
 U 1109, 0001,203C,69F0,2DC0,0000,1154 :1869
 U 1154, 0001,203C,81F0,2DD0,0000,1000 :1870
 U 1000, 0001,203D,0180,09F0,0000,127A :1871

TRPH1: RC[0D] SC
 =0 SETRCF[.9]
 Q_ID[TBER0]
 RC[6]_Q,Q_ID[TBER1]
 RC[7]_Q,Q_ID[SBI.ERR]
 RC[0B]_Q,Q_ID[FAULT]
 RC[0C]_Q,Q_ID[MAINT]
 RC[9]_Q,Q_ID[PARITY]
 RC[8]_Q,Q_ID[TIME.ADDR]
 RC[0A]_Q,Q_ID[USTACK]
 RC[0E]_Q,ERROR1

1000:

:+
 ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
 ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWST
 ERLOOP
 ERROR1
 ERROR2

U 1268, 0000,003C,65F8,0800,0084,7269 :1880
 U 1269, 0818,0038,8D80,0800,0000,126A :1881
 U 126A, 0D00,003C,0180,0800,0000,126B :1882
 U 126B, 0000,003C,3D80,3C00,0000,126C :1883
 U 126C, 0818,0038,0580,0800,0000,126D :1884
 U 126D, 0D00,003C,0180,0800,0000,126E :1885
 U 126E, 0F00,003C,3180,3C00,0000,126F :1886
 U 126F, 0000,003C,5D80,3C00,0000,1270 :1887
 U 1270, 0000,003C,3980,3C00,0000,1271 :1888
 U 1271, 0000,003C,2980,3C00,0000,1272 :1889
 U 1272, 0000,003C,4980,3C00,0000,1273 :1890
 U 1273, 0818,0038,C180,0800,0000,1274 :1891
 U 1274, 0000,003C,6580,3C00,0000,1275 :1892
 U 1275, 0F00,003C,6D80,3C00,0000,1276 :1893
 U 1276, 0000,003C,6D80,3C00,0000,1277 :1894
 U 1277, 0000,003C,6580,3C00,0000,1278 :1895
 U 1278, 0003,003C,0180,0AF8,0000,105E :1896
 U 1279, 0818,0038,0980,0800,0000,105E :1897
 U 127A, 0810,0038,0180,0978,0000,127B :1898
 U 127B, 0819,0034,4D80,0800,0000,104E :1899
 U 104E, 0819,0030,1180,0800,0000,105E :1900
 U 127C, 0810,0038,0180,0978,0000,127D :1901
 U 127D, 0819,0034,4D80,0800,0000,105A :1902
 U 105A, 0819,0030,D580,0800,0000,105E :1903

SCOPE: SC_K[.10],Q_0

; SETUP TO WRITE IPL OF 1F

; ...

D_K[.1F]

D-DAL.SC

ID[PSL]_D

; WRITE THE PSL

D_K[.1]

; SETUP TO CLEAR THE CES REGISTER

D-DAL.SC

ID[CES]_D,D_0

; CLEAR THE CES REGISTER

ID[ACC.CS]_D

; SHUT OFF THE FLOATING POINT

ID[SIR]_D

; CLEAR THE SIR REGISTER

ID[CLK.CS]_D

; STOP INTERVAL TIMER

ID[TBER0]_D

; SHUT OFF THE TB

D_K[.FFFF]

ID[SBI.ERR]_D

ID[FAULT]_D,D_0

ID[FAULT]_D

ID[SBI.ERR]_D

RC[0F]_0,J/CALLCON

; CALL THE CONSOLE

ERLOOP: D_K[.2],J/CALLCON

; ERRLOOP CALL

ERROR1: D_RC[0F]

D_D.AND.K[.FF00]

104E: D_D.OR.K[.4],J/CALLCON

ERROR2: D_RC[0F]

D_D.AND.K[.FF00]

105A: D_D.OR.K[.6],J/CALLCON

105E:

CALLCON:

ID[TXDB]_D,J/CALLCON

; CALL THE CONSOLE

U 105E, 0000,003C,1D80,3C00,0000,105E :1906

:+

; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 13F0, 0000,003C,0180,0800,0000,13F1 :1910
 U 13F1, 0000,003C,0180,0800,0000,13F2 :1911
 U 13F2, 0000,003C,0180,0800,0000,13F3 :1912
 U 13F3, 0000,003C,0180,0800,0000,13F4 :1913
 U 13F4, 0000,003C,0180,0800,0000,13F5 :1914
 U 13F5, 0000,003C,0180,0800,0000,13F6 :1915

13F0: NOP
 13F1: NOP
 13F2: NOP
 13F3: NOP
 13F4: NOP
 13F5: NOP

```

U 13F6, 0000,003C,0180,0800,0000,13F7 :1916
U 13F7, 0000,003C,0180,0800,0000,13F8 :1917
U 13F8, 0000,003C,0180,0800,0000,13F9 :1918
U 13F9, 0000,003C,0180,0800,0000,13FA :1919
U 13FA, 0000,003C,0180,0800,0000,13FB :1920
U 13FB, 0000,003C,0180,0800,0000,13FC :1921
U 13FC, 0000,003C,0180,0800,0000,13FD :1922
U 13FD, 0000,003C,0180,0800,0000,13FE :1923
U 13FE, 0000,003C,0180,0800,0000,13FF :1924
U 13FF, 0000,003C,0180,0800,0000,1155 :1925
U 1155, 0000,003C,0180,0800,0000,12AA :1926
U 12AA, 0000,003C,0180,0800,0000,127E :1927

```

```

13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

```

```

:1928
:1929 :+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1930 : THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1931 : TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1932 : TYPING IT.
:1933 :-

```

```

U 127E, 0810,0038,4D80,0978,0000,127F :1934
U 127F, 0019,4016,4D80,09F8,0000,0001 :1935

```

```

SUBTST: D_RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

```

```

:1936
:1937 :+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:1938 : LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:1939 : WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:1940 :-

```

```

U 1280, 0010,0038,01C0,0978,0000,1281 :1941
U 1281, 0019,2034,4DC0,0800,0000,1282 :1942
U 1282, 0019,2032,1D80,09F8,0000,0001 :1943

```

```

SETRCF: Q_RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1

```

```

:1944
:1945 : THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

```

```

U 1283, 0118,0038,1B80,0800,0000,1287 :1946
U 1284, 0118,0038,0B80,0800,0000,1287 :1947
U 1285, 0118,0038,0780,0800,0000,1287 :1948
U 1286, 0118,0038,C380,0800,0000,1287 :1949

```

```

S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
=0000

```

```

U 1010, 0018,0038,1980,0800,0000,1283 :1951
U 1011, 0018,0038,1980,0800,0000,1284 :1952
U 1012, 0018,0038,1980,0800,0000,1285 :1953
U 1013, 0018,0038,1980,0800,0000,1286 :1954
U 1014, 0018,0038,0980,0800,0000,1283 :1955
U 1015, 0018,0038,0980,0800,0000,1284 :1956
U 1016, 0018,0038,0980,0800,0000,1285 :1957
U 1017, 0018,0038,0980,0800,0000,1286 :1958
U 1018, 0018,0038,0580,0800,0000,1283 :1959
U 1019, 0018,0038,0580,0800,0000,1284 :1960
U 101A, 0018,0038,0580,0800,0000,1285 :1961
U 101B, 0018,0038,0580,0800,0000,1286 :1962
U 101C, 0018,0038,C180,0800,0000,1283 :1963
U 101D, 0018,0038,C180,0800,0000,1284 :1964
U 101E, 0018,0038,C180,0800,0000,1285 :1965
U 101F, 0018,0038,C180,0800,0000,1286 :1966
U 1287, 0100,003E,0380,0800,0000,0001 :1967
U 1288, 0F00,003C,0180,0800,0000,1289 :1968
U 1289, 0819,0000,0580,0800,0000,1010 :1969

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D_D.LEFT2,SI/7,RETURN1
DC.NF: D_0
D-D-K[.1],J/DC0

```

```

:1970 : THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.

```

```

:1971
U 100A. 0000.003D.0180.0800.0000.100B :1972
U 100B. 0000.003C.01A8.0800.0000.128A :1973
U 128A. 0000.003C.01A8.0800.0000.128B :1974
U 128B. 0000.003C.01A8.0800.0000.128C :1975
U 128C. 0000.003C.01A8.0800.0000.128D :1976
U 128D. 0000.003C.01A8.0800.0000.128E :1977
U 128E. 0000.003C.01A8.0800.0000.128F :1978
U 128F. 0000.003C.01A8.0800.0000.1290 :1979
U 1290. 0000.003E.01A8.0800.0000.0001 :1980
:1981
:1982
U 1040. 0000.003D.0180.0800.0000.1291 :1983
U 1041. 0000.003C.0180.0800.0000.1291 :1984
U 1291. 0000.003C.03A8.0800.0000.1292 :1985
U 1292. 0000.003C.03A8.0800.0000.1293 :1986
U 1293. 0000.003C.03A8.0800.0000.1294 :1987
U 1294. 0000.003C.03A8.0800.0000.1295 :1988
U 1295. 0000.003C.03A8.0800.0000.1296 :1989
U 1296. 0000.003C.03A8.0800.0000.1297 :1990
U 1297. 0000.003C.03A8.0800.0000.1298 :1991
U 1298. 0000.003E.03A8.0800.0000.0001 :1992
:1993
:1994
U 1020. 0001.203E.0180.0980.0000.0001 :1995
U 1021. 0001.203E.0180.0988.0000.0001 :1996
U 1022. 0001.203E.0180.0990.0000.0001 :1997
U 1023. 0001.203E.0180.0998.0000.0001 :1998
U 1024. 0001.203E.0180.09A0.0000.0001 :1999
U 1025. 0001.203E.0180.09A8.0000.0001 :2000
U 1026. 0001.203E.0180.09B0.0000.0001 :2001
U 1027. 0001.203E.0180.09B8.0000.0001 :2002
U 1028. 0001.203E.0180.09C0.0000.0001 :2003
U 1029. 0001.203E.0180.09C8.0000.0001 :2004
U 102A. 0001.203E.0180.09D0.0000.0001 :2005
U 102B. 0001.203E.0180.09D8.0000.0001 :2006
U 102C. 0001.203E.0180.09E0.0000.0001 :2007
U 102D. 0001.203E.0180.09E8.0000.0001 :2008
U 102E. 0001.203E.0180.09F0.0000.0001 :2009
U 102F. 0001.203E.0180.09F8.0000.0001 :2010
:2011
:2012
U 1030. 0000.003E.0180.0900.0000.0001 :2013
U 1031. 0000.003E.0180.0908.0000.0001 :2014
U 1032. 0000.003E.0180.0910.0000.0001 :2015
U 1033. 0000.003E.0180.0918.0000.0001 :2016
U 1034. 0000.003E.0180.0920.0000.0001 :2017
U 1035. 0000.003E.0180.0928.0000.0001 :2018
U 1036. 0000.003E.0180.0930.0000.0001 :2019
U 1037. 0000.003E.0180.0938.0000.0001 :2020
U 1038. 0000.003E.0180.0940.0000.0001 :2021
U 1039. 0000.003E.0180.0948.0000.0001 :2022
U 103A. 0000.003E.0180.0950.0000.0001 :2023
U 103B. 0000.003E.0180.0958.0000.0001 :2024
U 103C. 0000.003E.0180.0960.0000.0001 :2025

```

```

=0
SHQLFT16: CALL,J/SHQLFT8
SHQLFT8: Q-Q.LEFT,SI/3
SHQLFT7: Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3
          Q-Q.LEFT,SI/3,RETURN1
: THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
=0
SHQL16: CALL,J/SHQL8
          J/SHQL8
SHQL8: Q-Q.LEFT,SI/7
SHQL7: Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7
          Q-Q.LEFT,SI/7,RETURN1
: THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
=0000
WRRRC: RC[0] Q,RETURN1
        RC[1] Q,RETURN1
        RC[2] Q,RETURN1
        RC[3] Q,RETURN1
        RC[4] Q,RETURN1
        RC[5] Q,RETURN1
        RC[6] Q,RETURN1
        RC[7] Q,RETURN1
        RC[8] Q,RETURN1
        RC[9] Q,RETURN1
        RC[0A] Q,RETURN1
        RC[0B] Q,RETURN1
        RC[0C] Q,RETURN1
        RC[0D] Q,RETURN1
        RC[0E] Q,RETURN1
        RC[0F] Q,RETURN1
: THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
=0000
LTCHRC: LC-RC[0],RETURN1
        LC-RC[1],RETURN1
        LC-RC[2],RETURN1
        LC-RC[3],RETURN1
        LC-RC[4],RETURN1
        LC-RC[5],RETURN1
        LC-RC[6],RETURN1
        LC-RC[7],RETURN1
        LC-RC[8],RETURN1
        LC-RC[9],RETURN1
        LC-RC[0A],RETURN1
        LC-RC[0B],RETURN1
        LC-RC[0C],RETURN1

```

ZZ-ESKAH-V132 Subroutines
ESKAH21.MCR

MICRO2 1M(01)

16-DEC-82 10:51:29

U 103D, 0000,003E,0180,0968,0000,0001	:2026	LC_RC[OD],RETURN1
U 103E, 0000,003E,0180,0970,0000,0001	:2027	LC_RC[OE],RETURN1
U 103F, 0000,003E,0180,0978,0000,0001	:2028	LC_RC[OF],RETURN1
	:2029	; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
	:2030	; CONTENTS OF Q.
	:2031	=0
U 1042, 0F00,003D,0180,0800,0000,1288	:2032	RC.Q: D_0,CALL,J/DC.NF
U 1043, 0000,003C,0180,0800,0000,1044	:2033	NOP
	:2034	=0
U 1044, 0000,193D,0180,0800,0000,1020	:2035	RC.QA: CALL,D3-0?,J/WRR
U 1045, 0819,0014,0580,0800,0010,1299	:2036	D_D+K[.1],CLK.UBCC
U 1299, 0000,013C,0180,0800,0000,1048	:2037	Z?
U 1048, 0000,003C,0180,0800,0000,1044	:2038	=0
U 1049, 0000,003E,0180,0800,0000,0001	:2039	J/RC.QA
		RETURN1


```

:2040 .PAGE 'TEST 4E FLOAT 1 THROUGH 0'S IN RC REGISTERS TEST'
:2041 *****
:2042 **
:2043 TEST 4E FLOATING 1 THROUGH 0'S TEST OF RC REGISTERS
:2044
:2045 TEST DESCRIPTION
:2046 THIS TEST FLOATS A 1 THRU 0'S IN EACH RC SCRATCH PAD
:2047 REGISTER.
:2048
:2049 LOGIC DESCRIPTION
:2050 THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
:2051 ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
:2052 ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
:2053 TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
:2054 ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
:2055 IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
:2056 DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
:2057 ARE PARTITIONED THUS:
:2058 BITS <07:00> ARE ON DCP
:2059 BITS <15:08> ARE ON DDP
:2060 BITS <31:16> ARE ON DEP
:2061 CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
:2062 IDENTIFY WHICH BIT SLICE IS AT FAULT.
:2063
:2064 ERROR DEScriptIO
:2065 EXPECTED DATA
:2066 GOT DATA
:2067 REGISTER ADDRESS
:2068
:2069 --
:2070 *****
:2071 =0
:2072 FL1RC: NEWTST
:2073 Q 0
:2074 =0 CALL,J/RC.Q ; CLEAR ALL RC REGISTERS.
:2075 NOP
:2076 =0 CALL,J/DC.NF ; SET UP A COUNTER IN D.
:2077 RC0_D
:2078 =0
:2079 FL1RC1: RC[1]_K[1],ERLOOP
:2080 FL1RC2: D RC0
:2081 =0 CALL,D3-0?,J/WRRRC,Q_RC[1] ; WRITE TEST PATTERN
:2082 NOP
:2083 =0 CALL,D3-0?,J/LTCHRC ; READ TEST PATTERN
:2084 ALU_Q[A-B]LC,CLK.UBCC
:2085 Z? ; Q=LC?
:2086 =0 J/FL1RC3,RC[0F]_K[.3]
:2087 J/FL1RC4
:2088 FL1RC3: RC[0E]_Q
:2089 RC[0D]_LC
:2090 ERROR1,RC[0C] D ; RC REGISTER DATA INCORRECT
:2091 FL1RC4: Q RC[1],CLK.UBCC ; TRIED ALL PATTERNS YET?
:2092 Z?,Q Q.LEFT,S1/3 ; IF NOT SHIFT PATTERN AND CONTINUE
:2093 =0 RC[1]_Q,J/FL1RC2 ; TESTING THIS REGISTER
:2094 LAB_RC0
```

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U 104A, 0000,003D,0180,0800,0000,1268
U 104B, 0000,003C,01F8,0800,0000,1050
U 1050, 0000,003D,0180,0800,0000,1042
U 1051, 0000,003C,0180,0800,0000,1052
U 1052, 0000,003D,0180,0800,0000,1288
U 1053, 0001,003C,0180,0A80,0000,1054
:
U 1054, 0018,0039,0580,0A88,0000,1279
U 1055, 0800,003C,0180,0A00,0000,1058
U 1058, 0000,193D,01C0,0A08,0000,1020
U 1059, 0000,003C,0180,0800,0000,1060
U 1060, 0000,193D,0180,0800,0000,1030
U 1061, 0011,2000,0180,0800,0010,129A
U 129A, 0000,013C,0180,0800,0000,1062
U 1062, 0018,0038,0D80,09F8,0000,129B
U 1063, 0000,003C,0180,0800,0000,129E
U 129B, 0001,203C,0180,09F0,0000,129C
U 129C, 0010,0038,0180,09E8,0000,129D
U 129D, 0001,003D,0180,09E0,0000,127A
U 129E, 0000,003C,01C0,0A08,0010,129F
U 129F, 0000,013C,01A8,0800,0000,1068
U 1068, 0001,203C,0180,0A88,0000,1055
U 1069, 0000,003C,0180,0A00,0000,12A0
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ZZ-ESKAM-V132 TEST 4E FLOAT 1 THROUGH 0'S IN RC REGISTERS TEST I 10
ESKAM21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

SEQ 0121
Page 5

U 12A0, 0018,0014,0580,0A80,0010,12A1	:2095		R[0]_LA+K[.1],CLK.UBCC	: ALL REGISTERS TESTED?
U 12A1, 0000,013C,0180,0800,0000,106A	:2096		Z?	
U 106A, 0018,0038,0580,0A88,0000,1055	:2097	=0	R[1]_K[.1],J/FL1RC2	: IF NOT GO TO NEXT REGISTER
U 106B, 0000,003C,0180,0800,0000,1076	:2098		NOP	

```

:2099 .PAGE 'TEST 4F FLOAT 0 THROUGH 1'S IN RC REGISTERS TEST'
:2100 *****
:2101 **
:2102 TEST 4F FLOATING 0 THROUGH 1'S TEST OF RC REGISTERS
:2103
:2104 TEST DESCRIPTION
:2105 THIS TEST FLOATS A 0 THRU 1'S IN EACH RC SCRATCH PAD
:2106 REGISTER.
:2107
:2108 LOGIC DESCRIPTION
:2109 THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
:2110 ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
:2111 ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
:2112 TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
:2113 ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
:2114 IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
:2115 DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
:2116 ARE PARTITIONED THUS:
:2117 BITS <07:00> ARE ON DCP
:2118 BITS <15:08> ARE ON DDP
:2119 BITS <31:16> ARE ON DEP
:2120 CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
:2121 IDENTIFY WHICH BIT SLICE IS AT FAULT.
:2122
:2123 ERROR DESCRIPTION
:2124 EXPECTED DATA
:2125 GOT DATA
:2126 REGISTER ADDRESS
:2127
:2128 --
:2129 *****
:2130 =0
:2131 FLORC: NEWTST
:2132 Q,ALU,ALU_0-K[.1]
:2133 =0 CALL,J/RC-Q ; SET ALL RC=-1
:2134 NOP
:2135 =0 CALL,J/DC.NF ; SET UP COUNTER.
:2136 RC[0] D
:2137 FLORC1: ALU_0-K[.1],Q,ALU
:2138 Q,Q.RIGHT,S1/3
:2139 =0 RC[1] Q,ERLOOP
:2140 FLORC2: D RC[0]
:2141 =0 CALL,BEN/D3-0,J/WRRRC,Q_RC[1] ; WRITE TEST PATTERN
:2142 NOP
:2143 =0 CALL,D3-0?,J/LTCHRC ; READ TEST PATTERN
:2144 ALU_Q[A-B]LC,CLK.UBCC
:2145 Z? ; Q=LC?
:2146 =0 J/FLORC3,RC[0F]_K[.3]
:2147 J/FLORC4
:2148 FLORC3: RC[0E]_Q
:2149 RC[0D]_LC
:2150 ERROR1,RC[0C]_D ; RC REGSIER DATA INCORRECT
:2151 FLORC4: Q RC[1]
:2152 A[CU LA+K[.1],CLK.UBCC ; TRIED ALL PATTERNS YET?
:2153 Z?,Q,Q.RIGHT,S1/7 ; IF NOT SHIFT PATTERN AND CONTINUE

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U 1076, 0000,003D,0180,0800,0000,1268
U 1077, 001B,0000,05C0,0800,0000,107E
U 107E, 0000,003D,0180,0800,0000,1042
U 107F, 0000,003C,0180,0800,0000,1080
U 1080, 0000,003D,0180,0800,0000,1288
U 1081, 0001,003C,0180,0A80,0000,12A2
U 12A2, 001B,0000,05C0,0800,0000,12A3
U 12A3, 0000,003C,0180,0800,0000,1082
U 1082, 0001,203D,0180,0A88,0000,1279
U 1083, 0800,003C,0180,0A00,0000,1084
U 1084, 0000,193D,01C0,0A08,0000,1020
U 1085, 0000,003C,0180,0800,0000,1086
U 1086, 0000,193D,0180,0800,0000,1030
U 1087, 0011,2000,0180,0800,0010,12A4
U 12A4, 0000,013C,0180,0800,0000,1088
U 1088, 0018,0038,0D80,09F8,0000,12A5
U 1089, 0000,003C,0180,0800,0000,12A8
U 12A5, 0001,203C,0180,09F0,0000,12A6
U 12A6, 0010,0038,0180,09E8,0000,12A7
U 12A7, 0001,003D,0180,09E0,0000,127A
U 12A8, 0000,003C,01C0,0A08,0000,12A9
U 12A9, 0018,0014,0580,0800,0010,12AB
U 12AB, 0000,013C,03B0,0800,0000,108A

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ZZ-ESKAH-V132 TEST 4F FLOAT 0 THROUGH 1'S IN RC REGISTERS TEST K 10
ESKAH21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

SEQ 0123
Page 5

U 108A,	0001,203C,0180,0A88,0000,1083	:2154	=0	RC1] Q,J/FLORC2	: TESTING THIS REGISTER
U 108B,	0000,003C,0180,0A00,0000,12AC	:2155		LAB RC0]	
U 12AC,	0018,0014,0580,0A80,0010,12AD	:2156		RC0]_LA+K[.1],CLK.UBCC	: ALL REGISTER TESTED?
U 12AD,	0000,013C,0180,0800,0000,108C	:2157		Z?	
U 108C,	0000,003C,0180,0800,0000,12A2	:2158	=0	J/FLORC1	: IF NOT CONTINUE
U 108D,	0000,003C,0180,0800,0000,108E	:2159		NOP	

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[illegible]

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U 109D, 0000,003C,0180,0800,0000,109E :2215 NOP
U 109E, 0000,193D,0180,0800,0000,1010 :2216 =0 CALL,D3-0?,J/DC0
U 109F, 0000,003C,01E0,0800,0000,10A0 :2217 Q D
U 10A0, 0000,193D,0180,0800,0000,1020 :2218 =0 CALL,D3-0?,J/WRR0 ; GO WRITE THIS DATA INTO
:2219 ; THE REGISTER ADDRESSED BY D<03:00>
U 10A1, 0819,0014,0580,0800,0010,12AE :2220 ALU_D+K[.1],D_ALU,CLK.UBCC ; WRITTEN ALL REGISTER?
U 12AE, 0000,013C,0180,0800,0000,10A2 :2221 Z?
U 10A2, 0000,003C,0180,0800,0000,1090 :2222 =0 J/RCD1A ; IF NOT CONTINUE.
U 10A3, 0F00,003C,01F8,0800,0000,10A4 :2223 D 0,Q 0 ; NOW GO READ ALL REGISTER BACK.
U 10A4, 0000,003D,0180,0800,0000,1279 :2224 =0 ERLOOP
U 10A5, 0C00,003C,0180,0800,0000,10A6 :2225 D_Q
:2226 =0
U 10A6, 0000,193D,0180,0800,0000,1010 :2227 RCD1B: CALL,D3-0?,J/DC0
U 10A7, 0000,003C,0180,0800,0000,10A8 :2228 NOP
U 10A8, 0000,193D,0180,0800,0000,1010 :2229 =0 CALL,D3-0?,J/DC0
U 10A9, 0000,003C,0180,0800,0000,10AA :2230 NOP
U 10AA, 0000,193D,0180,0800,0000,1010 :2231 =0 CALL,D3-0?,J/DC0
U 10AB, 0000,003C,0180,0800,0000,10AC :2232 NOP
U 10AC, 0000,193D,0180,0800,0000,1010 :2233 =0 CALL,D3-0?,J/DC0
U 10AD, 0000,003C,0180,0800,0000,10AE :2234 NOP
U 10AE, 0000,193D,0180,0800,0000,1010 :2235 =0 CALL,D3-0?,J/DC0
U 10AF, 0000,003C,0180,0800,0000,10B0 :2236 NOP
U 10B0, 0000,193D,0180,0800,0000,1010 :2237 =0 CALL,D3-0?,J/DC0
U 10B1, 0000,003C,0180,0800,0000,10B2 :2238 NOP
U 10B2, 0000,193D,0180,0800,0000,1010 :2239 =0 CALL,D3-0?,J/DC0
U 10B3, 0000,003C,0180,0800,0000,10B4 :2240 NOP
U 10B4, 0000,193D,0180,0800,0000,1010 :2241 =0 CALL,D3-0?,J/DC0
U 10B5, 0000,003C,01E0,0800,0000,10B6 :2242 Q D
U 10B6, 0000,193D,0180,0800,0000,1030 :2243 =0 CALL,D3-0?,J/LTCHRC ; READ THE REGISTER.
U 10B7, 0011,2000,0180,0800,0010,12AF :2244 RCD1D: ALU_Q[A-B]LC,CLK.UBCC ; CHECK LC
U 12AF, 0000,013C,0180,0800,0000,10B8 :2245 Z?
U 10B8, 0000,003C,0180,0800,0000,12B0 :2246 =0 J/RCD1E
U 10B9, 0000,003C,0180,0800,0000,12B3 :2247 J/RCD1F
U 12B0, 0018,0038,0980,09F8,0000,12B1 :2248 RCD1E: RC[0F]_K[.2]
U 12B1, 0001,203C,0180,09F0,0000,12B2 :2249 RC[0E]_Q
U 12B2, 0010,0039,0180,09E8,0000,127A :2250 RC[0D]_LC,ERROR1 ; RC ADDRESSING FAILURE.
U 12B3, 0819,0014,0580,0800,0010,12B4 :2251 RCD1F: ALU_D+K[.1],D_ALU,CLK.UBCC ; CHECKED ALL REGISTERS?
U 12B4, 0000,013C,0180,0800,0000,10BA :2252 Z?
U 10BA, 0000,003C,0180,0800,0000,10A6 :2253 =0 J/RCD1B ; IF NOT CONTINUE.
U 10BB, 0000,003C,0180,0800,0000,10BC :2254 NOP
    
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:2255 .PAGE 'TEST 51 RC REGISTERS BACKWARD DUAL ADDRESSING TEST'
:2256 *****
:2257 +-
:2258 TEST 51 RC BACKWARD DUAL ADDRESSING TEST
:2259
:2260 TEST DESCRIPTION
:2261 THIS TEST WRITES THE PATTERN:
:2262 FFFFFFFF IN RC[0F]
:2263 EEEEEEEE IN RC[0E]
:2264 DDDDDDDD IN RC[0D]
:2265 CCCCCCCC IN RC[0C]
:2266 ETC. TO
:2267 00000000 IN RC[0]
:2268 AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
:2269 THE REGISTERS ARE WRITTEN IN THE BACKWARD, DECREMENTING THE ADDRESS,
:2270 DIRECTION.
:2271
:2272 LOGIC DESCRIPTION
:2273 THIS IS A TEST OF THE REGISTER CONTRCL FIELD, USPO, DECODE
:2274 ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
:2275 ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
:2276 TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
:2277 ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
:2278 IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
:2279 DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
:2280 ARE PARTITIONED THUS:
:2281 BITS <07:00> ARE ON DCP
:2282 BITS <15:08> ARE ON DDP
:2283 BITS <31:16> ARE ON DEP
:2284 CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
:2285 IDENTIFY WHICH BIT SLICE IS AT FAULT.
:2286
:2287 ERROR DESCRIPTION
:2288 EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
:2289 GOT DATA
:2290
:2291 --
:2292 *****
:2293 =0
:2294 RCDA2: NEWTST
:2295 D 0 ; INITIALIZE DATA AND REGISTER ADDRESS
:2296 =0 CALL,J/DCF
:2297 NOP
:2298 =0
:2299 RCD2A: CALL,D3-0?,J/DCO
:2300 NOP
:2301 =0 CALL,D3-0?,J/DCO
:2302 NOP
:2303 =0 CALL,D3-0?,J/DCO
:2304 NOP
:2305 =0 CALL,D3-0?,J/DCO
:2306 NOP
:2307 =0 CALL,D3-0?,J/DCO
:2308 NOP
:2309 =0 CALL,D3-0?,J/DCO

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U 10BC, 0000,003D,0180,0800,0000,1268
U 10BD, 0F00,003C,0180,0800,0000,10BE
U 10BE, 0000,003D,0180,0800,0000,101F
U 10BF, 0000,003C,0180,0800,0000,10C0

U 10C0, 0000,193D,0180,0800,0000,1010
U 10C1, 0000,003C,0180,0800,0000,10C2
U 10C2, 0000,193D,0180,0800,0000,1010
U 10C3, 0000,003C,0180,0800,0000,10C4
U 10C4, 0000,193D,0180,0800,0000,1010
U 10C5, 0000,003C,0180,0800,0000,10C6
U 10C6, 0000,193D,0180,0800,0000,1010
U 10C7, 0000,003C,0180,0800,0000,10C8
U 10C8, 0000,193D,0180,0800,0000,1010
U 10C9, 0000,003C,0180,0800,0000,10CA
U 10CA, 0000,193D,0180,0800,0000,1010

U 10CB.	0000,003C,0180,0800,0000,10CC	:2310		NOP
U 10CC.	0000,193D,0180,0800,0000,1010	:2311	=0	CALL,D3-0?,J/DC0
U 10CD.	0000,003C,0180,0800,0000,10CE	:2312		NOP
U 10CE.	0000,193D,0180,0800,0000,1010	:2313	=0	CALL,D3-0?,J/DC0
U 10CF.	0000,003C,01E0,0800,0000,10D0	:2314		Q D
U 10D0.	0000,193D,0180,0800,0000,1020	:2315	=0	CALL,D3-0?,J/WRR ; GO WRITE THIS DATA INTO
		:2316		THE REGISTER ADDRESSED BY D<03:00>
U 10D1.	0001,003C,0180,0800,0010,12B5	:2317		ALU_D,CLK.UBCC ; WRITTEN ALL REGISTER?
U 12B5.	0000,013C,0180,0800,0000,10D2	:2318		Z?
U 10D2.	0819,0000,0580,0800,0000,10C0	:2319	=0	D_D-KC.1],J/RCD2A ; IF NOT CONTINUE.
U 10D3.	0F00,003C,01F8,0800,0000,10D4	:2320		D_0,Q 0 ; NOW GO READ ALL REGISTER BACK.
U 10D4.	0000,003D,0180,0800,0000,101F	:2321	=0	CALL,J/DCF
U 10D5.	0000,003C,01E0,0800,0000,10D6	:2322		Q D
U 10D6.	0000,003D,0180,0800,0000,1279	:2323	=0	ERLOOP
U 10D7.	0C00,003C,0180,0800,0000,10D8	:2324		D_Q
		:2325	=0	
U 10D8.	0000,193D,0180,0800,0000,1010	:2326	RCD2B:	CALL,D3-0?,J/DC0
U 10D9.	0000,003C,0180,0800,0000,10DA	:2327		NOP
U 10DA.	0000,193D,0180,0800,0000,1010	:2328	=0	CALL,D3-0?,J/DC0
U 10DB.	0000,003C,0180,0800,0000,10DC	:2329		NOP
U 10DC.	0000,193D,0180,0800,0000,1010	:2330	=0	CALL,D3-0?,J/DC0
U 10DD.	0000,003C,0180,0800,0000,10DE	:2331		NOP
U 10DE.	0000,193D,0180,0800,0000,1010	:2332	=0	CALL,D3-0?,J/DC0
U 10DF.	0000,003C,0180,0800,0000,10E0	:2333		NOP
U 10E0.	0000,193D,0180,0800,0000,1010	:2334	=0	CALL,D3-0?,J/DC0
U 10E1.	0000,003C,0180,0800,0000,10E2	:2335		NOP
U 10E2.	0000,193D,0180,0800,0000,1010	:2336	=0	CALL,D3-0?,J/DC0
U 10E3.	0000,003C,0180,0800,0000,10E4	:2337		NOP
U 10E4.	0000,193D,0180,0800,0000,1010	:2338	=0	CALL,D3-0?,J/DC0
U 10E5.	0000,003C,0180,0800,0000,10E6	:2339		NOP
U 10E6.	0000,193D,0180,0800,0000,1010	:2340	=0	CALL,D3-0?,J/DC0
U 10E7.	0000,003C,01E0,0800,0000,10E8	:2341		Q D
U 10E8.	0000,193D,0180,0800,0000,1030	:2342	=0	CALL,D3-0?,J/LTCHRC ; READ THE REGISTER.
U 10E9.	0011,2000,0180,0800,0010,12B6	:2343	RCD2D:	ALU_Q[A-B]LC,CLK.UBCC ; CHECK LC
U 12B6.	0000,013C,0180,0800,0000,10EA	:2344		Z?
U 10EA.	0000,003C,0180,0800,0000,12B7	:2345	=0	J/RCD2E
U 10EB.	0000,003C,0180,0800,0000,12BA	:2346		J/RCD2F
U 12B7.	0018,0038,0980,09F8,0000,12B8	:2347	RCD2E:	RC[0F]_K[.2]
U 12B8.	0001,203C,0180,09F0,0000,12B9	:2348		RC[0E]_Q
U 12B9.	0010,0039,0180,09E8,0000,127A	:2349		RC[0D]_LC,ERROR1 ; RC ADDRESSING FAILURE.
U 12BA.	0001,003C,0180,0800,0010,12BB	:2350	RCD2F:	ALU_D,CLK.UBCC ; CHECKED ALL REGISTERS?
U 12BB.	0000,013C,0180,0800,0000,10EC	:2351		Z?
U 10EC.	0819,0000,0580,0800,0000,10D8	:2352	=0	D_D-KC.1],J/RCD2B ; IF NOT CONTINUE.
U 10ED.	0000,003C,0180,0800,0000,10EE	:2353		NOP


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:2354 .PAGE "TEST 52 GALLOP 1'S IN RC REGISTERS TEST"
:2355 *****
:2356 **
:2357 TEST 52 GALLOPING 1'S TEST OF RC REGISTERS
:2358
:2359 TEST DESCRIPTION
:2360 THIS TEST PERFORMS A GALLOPING 1'S TEST OF THE RC
:2361 SCRATCH PAD REGISTERS.
:2362
:2363 LOGIC DESCRIPTION
:2364 THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
:2365 ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
:2366 ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
:2367 TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
:2368 ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
:2369 IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
:2370 DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
:2371 ARE PARTITIONED THUS:
:2372 BITS <07:00> ARE ON DCP
:2373 BITS <15:08> ARE ON DDP
:2374 BITS <31:16> ARE ON DEP
:2375 CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
:2376 IDENTIFY WHICH BIT SLICE IS AT FAULT.
:2377 IF THE PREVIOUS TESTS RUN WITHOUT ERRORS THEN IF THIS TEST
:2378 FAILS THE MEMORY CHIPS THEMSELVES ARE MOST PROBABLY AT FAULT.
:2379
:2380 ERROR DESCRIPTION
:2381 DATA READ
:2382 ADDRESS FOR 1'S
:2383 ADDRESS OF 0'S
:2384 EXPECTED DATA
:2385
:2386 --
:2387 *****
:2388 =0
:2389 LCT1: NEWTST
:2390 Q 0
:2391 =0 CALL,J/RC.Q ; FILL RC WITH 0'S
:2392 D 0
:2393 =0 CALL,J/DC.NF ; PUT -OF INTO D.
:2394 NOP
:2395
:2396 =0
:2397 LCT1A: CALL,D3-0?,J/LTCHRC ; LATCH RC [D<3:0>]
:2398 ALU_LC,CLK.UBCC
:2399 Z? ; LC=0?
:2400 =0 J/LCT1A1,RC[0F]_K[.4]
:2401 J/LCT1A2
:2402 LCT1A1: RC[0E]_LC
:2403 RC[0B]_0
:2404 ERROR1,RC[0D]_D
:2405 LCT1A2: Q 0
:2406 Q-Q-K[.1],R[5] Q-K[.1]
:2407 =0 CALL,D3-0?,J/WRRCLAB_R[5] ; MAKE RC =-1
:2408 Q D
:2409 =0 CALL,J/DC.NF

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U 10EE, 0000,003D,0180,0800,0000,1268
 U 10EF, 0000,003C,01F8,0800,0000,10F0
 U 10F0, 0000,003D,0180,0800,0000,1042
 U 10F1, 0F00,003C,0180,0800,0000,10F2
 U 10F2, 0000,003D,0180,0800,0000,1288
 U 10F3, 0000,003C,0180,0800,0000,10F4

 U 10F4, 0000,193D,0180,0800,0000,1030
 U 10F5, 0010,0038,0180,0800,0010,128C
 U 12BC, 0000,013C,0180,0800,0000,10F6
 U 10F6, 0018,0038,1180,09F8,0000,12BD
 U 10F7, 0000,003C,0180,0800,0000,12C0
 U 12BD, 0010,0038,0180,09F0,0000,12BE
 U 12BE, 0003,003C,0180,09D8,0000,12BF
 U 12BF, 0001,003D,0180,09E8,0000,127A
 U 12C0, 0000,003C,01F8,0800,0000,12C1
 U 12C1, 0019,2000,05C0,0AA8,0000,10F8
 U 10F8, 0000,193D,0180,0A28,0000,1020
 U 10F9, 0000,003C,01E0,0800,0000,10FA
 U 10FA, 0000,003D,0180,0800,0000,1288

U 10FB,	001D,2000,0180,0800,0010,12C2	:2409	LCT1C:	ALU_Q-D,CLK.UBCC	
U 12C2,	0000,013C,0180,0800,0000,10FC	:2410		Z?	
U 10FC,	0C00,003C,01E0,0800,0000,10FE	:2411	=0	D_Q,Q_D,J/LCT1E	
U 10FD,	0000,003C,0180,0800,0000,12D5	:2412		J7LCTTI	
		:2413	=0		
U 10FE,	0000,193D,0180,0800,0000,1030	:2414	LCT1E:	CALL,D3-0?,J/LTCHRC	; READ -1
U 10FF,	0010,0000,0180,0800,0010,12C3	:2415		ALU_LACA-B]LC,CLK.UBCC	
U 12C3,	0000,013C,0180,0800,0000,110A	:2416		Z?	; LC=-1?
U 110A,	0018,0038,1180,09F8,0000,12C4	:2417	=0	J/LCT1E1,RC[0F]_K[.4]	
U 110B,	0000,003C,0180,0800,0000,12C8	:2418		J/LCT1E2	
U 12C4,	0010,0038,0180,09F0,0000,12C5	:2419	LCT1E1:	RC[0E]_LC	
U 12C5,	0001,003C,0180,09E8,0000,12C6	:2420		RC[0D]_D	
U 12C6,	001B,0000,0580,09D8,0000,12C7	:2421		ALU_Q-R[.1],RC[0B]_ALU	
U 12C7,	0001,203D,0180,09E0,0000,127A	:2422		ERROR1,RC[0C]_Q	
U 12C8,	0C00,003C,01E0,0800,0000,1110	:2423	LCT1E2:	D_Q,Q_D	
U 1110,	0000,193D,0180,0800,0000,1030	:2424	=0	CALL,D3-0?,J/LTCHRC	; READ 0
U 1111,	0010,0038,0180,0800,0010,12C9	:2425		ALU_LC,CLK.UBCC	
U 12C9,	0000,013C,0180,0800,0000,1112	:2426		Z?	; LC=0?
U 1112,	0018,0038,1180,09F8,0000,12CA	:2427	=0	J/LCT1E3,RC[0F]_K[.4]	
U 1113,	0000,003C,0180,0800,0000,12CE	:2428		J/LCT1E4	
U 12CA,	0010,0038,0180,09F0,0000,12CB	:2429	LCT1E3:	RC[0E]_LC	
U 12CB,	0001,003C,0180,09E8,0000,12CC	:2430		RC[0D]_D	
U 12CC,	0003,003C,0180,09D8,0000,12CD	:2431		RC[0B]_Q	
U 12CD,	0001,203D,0180,09E0,0000,127A	:2432		ERROR1,RC[0C]_Q	
U 12CE,	0C00,003C,01E0,0800,0000,1114	:2433	LCT1E4:	D_Q,Q_D	
U 1114,	0000,193D,0180,0800,0000,1030	:2434	=0	CALL,D3-0?,J/LTCHRC	; READ -1
U 1115,	0010,0000,0180,0800,0010,12CF	:2435		ALU_LACA-B]LC,CLK.UBCC	
U 12CF,	0000,013C,0180,0800,0000,1116	:2436		Z?	; LC=-1?
U 1116,	0018,0038,1180,09F8,0000,12D0	:2437	=0	J/LCT1E5,RC[0F]_K[.4]	
U 1117,	0000,003C,0180,0800,0000,12D4	:2438		J/LCT1E6	
U 12D0,	0010,0038,0180,09F0,0000,12D1	:2439	LCT1E5:	RC[0E]_LC	
U 12D1,	0001,003C,0180,09E8,0000,12D2	:2440		RC[0D]_D	
U 12D2,	001B,0000,0580,09D8,0000,12D3	:2441		ALU_Q-R[.1],RC[0B]_ALU	
U 12D3,	0001,203D,0180,09E0,0000,127A	:2442		ERROR1,RC[0C]_Q	
U 12D4,	0C00,003C,01E0,0800,0000,12D5	:2443	LCT1E6:	D_Q,Q_D	
U 12D5,	0819,0014,0580,0800,0010,12D6	:2444	LCT1I:	D-D+K[.1],CLK.UBCC	
U 12D6,	0000,013C,0180,0800,0000,1118	:2445		Z?	
U 1118,	0000,003C,0180,0800,0000,10FB	:2446	=0	J/LCT1C	
U 1119,	0C00,003C,01E0,0800,0000,12D7	:2447		D_Q,Q_D	
U 12D7,	0000,003C,01F8,0800,0000,111A	:2448		Q_0	
U 111A,	0000,193D,0180,0800,0000,1020	:2449	=0	CALL,D3-0?,J/WRRRC	
U 111B,	0819,0014,0580,0800,0010,12D8	:2450		D-D+K[.1],CLK.UBCC	
U 12D8,	0000,013C,0180,0800,0000,111C	:2451		Z?	
U 111C,	0000,003C,0180,0800,0000,10F4	:2452	=0	J/LCT1A	
U 111D,	0000,003C,0180,0800,0000,111E	:2453		NOP	

```

:2454 .PAGE 'TEST 53 GALLOP 0'S IN RC REGISTERS TEST'
:2455 *****
:2456 ++
:2457 TEST 53 GALLOPING 0'S TEST OF RC REGISTERS
:2458
:2459 TEST DESCRIPTION
:2460 THIS TEST PERFORMS A GALLOPING 0'S TEST OF THE RC SCRATCH
:2461 PAD REGISTERS.
:2462
:2463 LOGIC DESCRIPTION
:2464 THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
:2465 ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
:2466 ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
:2467 TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
:2468 ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
:2469 IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
:2470 DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
:2471 ARE PARTITIONED THUS:
:2472 BITS <07:00> ARE ON DCP
:2473 BITS <15:08> ARE ON DDP
:2474 BITS <31:16> ARE ON DEP
:2475 CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
:2476 IDENTIFY WHICH BIT SLICE IS AT FAULT.
:2477 IF THIS TEST FAILS AND ALL THE PREVIOUS TESTS RUN THEN THE
:2478 MEMORY CHIPS THEMSELVES ARE MOST PROBABLY AT FAULT.
:2479
:2480 ERROR DESCRIPTION
:2481 DATA READ
:2482 ADDRESS FOR 0'S
:2483 ADDRESS OF 1'S
:2484 EXPECTED DATA
:2485
:2486 --
:2487 *****
:2488 =0
:2489 LCT2: NEWTST
:2490 Q_0
:2491 Q-Q-K[.1],R[5] Q-K[.1]
:2492 =0 CALL,J/RC.Q,LAB_R[5]
:2493 D_0
:2494 =0 CALL,J/DC.NF
:2495 NOP
:2496 =0
:2497 LCT2A: CALL,D3-0?,J/LTCHRC
:2498 ALU_LA[A-B]LC,CLK.UBCC ; IS RC ==-1?
:2499 Z?
:2500 =0 J/LCT2A1,RC[0F]_K[.4]
:2501 J/LCT2A2
:2502 LCT2A1: RC[0E] LC
:2503 ALU 0-R[.1],RC[0B]_ALU
:2504 RC[0D]_D,ERROR1
:2505 LCT2A2: Q_0
:2506 =0 CALL,D3-0?,J/WRRRC ; WRITE 0.
:2507 Q_D
:2508 =0 CALL,J/DC.NF

```

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U 111E, 0000,003D,0180,0800,0000,1268
U 111F, 0000,003C,01F8,0800,0000,12D9
U 12D9, 0019,2000,05C0,0AA8,0000,1120
U 1120, 0000,003D,0180,0A28,0000,1042
U 1121, 0F00,003C,0180,0800,0000,1122
U 1122, 0000,003D,0180,0800,0000,1288
U 1123, 0000,003C,0180,0800,0000,1124

U 1124, 0000,193D,0180,0800,0000,1030
U 1125, 0010,0000,0180,0800,0010,12DA
U 12DA, 0000,013C,0180,0800,0000,1126
U 1126, 0018,0038,1180,09F8,0000,12DB
U 1127, 0000,003C,0180,0800,0000,12DE
U 12DB, 0010,0038,0180,09F0,0000,12DC
U 12DC, 001B,0000,058C,09D8,0000,12DD
U 12DD, 0001,003D,0180,09E8,0000,127A
U 12DE, 0000,003C,01F8,0800,0000,1128
U 1128, 0000,193D,0180,0800,0000,1020
U 1129, 0000,003C,01E0,0800,0000,112A
U 112A, 0000,003D,0180,0800,0000,1288

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U 112B.	001D,2000,0180,0800,0010,12DF	:2509	LCT2C:	ALU_Q-D,CLK.UBCC	
U 12DF.	0000,013C,0180,0800,0000,112C	:2510		Z?	
U 112C.	0C00,003C,01E0,0800,0000,112E	:2511	=0	D_Q,Q_D,J/LCT2E	
U 112D.	0000,003C,0180,0800,0000,12F2	:2512		J7LCT2I	
		:2513	=0		
U 112E.	0000,193D,0180,0800,0000,1030	:2514	LCT2E:	CALL,D3-0?,J/LTCHRC	; READ 0
U 112F.	0010,0038,0180,0800,0010,12E0	:2515		ALU_LC,CLK.UBCC	
U 12E0.	0000,013C,0180,0800,0000,1130	:2516		Z?	; IS LC=0?
U 1130.	0018,0038,1180,09F8,0000,12E1	:2517	=0	J/LCT2E1,RC[0F]_K[.4]	
U 1131.	0000,003C,0180,0800,0000,12E5	:2518		J/LCT2E2	
U 12E1.	0010,0038,0180,09F0,0000,12E2	:2519	LCT2E1:	RC[0E]_LC	
U 12E2.	0001,003C,0180,09E8,0000,12E3	:2520		RC[0D]_D	
U 12E3.	0003,003C,0180,09D8,0000,12E4	:2521		RC[0B]_0	
U 12E4.	0001,203D,0180,09E0,0000,127A	:2522		ERROR1,RC[0C]_Q	
U 12E5.	0C00,003C,01E0,0800,0000,1132	:2523	LCT2E2:	D_Q,Q_D	
U 1132.	0000,193D,0180,0800,0000,1030	:2524	=0	CALL,D3-0?,J/LTCHRC	; READ -1
U 1133.	0010,0000,0180,0800,0010,12E6	:2525		ALU_LA[A-B]LC,CLK.UBCC	
U 12E6.	0000,013C,0180,0800,0000,1134	:2526		Z?	; IS LC=-1?
U 1134.	0018,0038,1180,09F8,0000,12E7	:2527	=0	J/LCT2E3,RC[0F]_K[.4]	
U 1135.	0000,003C,0180,0800,0000,12EB	:2528		J/LCT2E4	
U 12E7.	0010,0038,0180,09F0,0000,12E8	:2529	LCT2E3:	RC[0E]_LC	
U 12E8.	0001,003C,0180,09E8,0000,12E9	:2530		RC[0D]_D	
U 12E9.	001B,0000,0580,09D8,0000,12EA	:2531		ALU_Q-R[.1],RC[0B]_ALU	
U 12EA.	0001,203D,0180,09E0,0000,127A	:2532		ERROR1,RC[0C]_Q	
U 12EB.	0C00,003C,01E0,0800,0000,1136	:2533	LCT2E4:	D_Q,Q_D	
U 1136.	0000,193D,0180,0800,0000,1030	:2534	=0	CALL,D3-0?,J/LTCHRC	; READ 0
U 1137.	0010,0038,0180,0800,0010,12EC	:2535		ALU_LC,CLK.UBCC	
U 12EC.	0000,013C,0180,0800,0000,1138	:2536		Z?	; IS LC=0?
U 1138.	0018,0038,1180,09F8,0000,12ED	:2537	=0	J/LCT2E5,RC[0F]_K[.4]	
U 1139.	0000,003C,0180,0800,0000,12F1	:2538		J/LCT2E6	
U 12ED.	0010,0038,0180,09F0,0000,12EE	:2539	LCT2E5:	RC[0E]_LC	
U 12EE.	0001,003C,0180,09E8,0000,12EF	:2540		RC[0D]_D	
U 12EF.	0003,003C,0180,09D8,0000,12F0	:2541		RC[0B]_0	
U 12F0.	0001,203D,0180,09E0,0000,127A	:2542		ERROR1,RC[0C]_Q	
U 12F1.	0C00,003C,01E0,0800,0000,12F2	:2543	LCT2E6:	D_Q,Q_D	
U 12F2.	0819,0014,0580,0800,0010,12F3	:2544	LCT2I:	D-D+K[.1],CLK.UBCC	
U 12F3.	0000,013C,0180,0800,0000,113A	:2545		Z?	
U 113A.	0000,003C,0180,0800,0000,112B	:2546	=0	J/LCT2C	
U 113B.	0C00,003C,01E0,0800,0000,12F4	:2547		D_Q,Q_D	
U 12F4.	0000,003C,01F8,0800,0000,12F5	:2548		Q-0	
U 12F5.	0019,2000,05C0,0800,0000,113C	:2549		Q-Q-K[.1]	
U 113C.	0000,193D,0180,0800,0000,1020	:2550	=0	CALL,D3-0?,J/WRRC	
U 113D.	0819,0014,0580,0800,0010,12F6	:2551		D-D+K[.1],CLK.UBCC	
U 12F6.	0000,013C,0180,0800,0000,113E	:2552		Z?	
U 113E.	0000,003C,0180,0800,0000,1124	:2553	=0	J/LCT2A	
U 113F.	0000,003C,0180,0800,0000,1140	:2554		NOP	


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U 1140, 0000,003D,0180,0800,0000,1268
U 1141, 0000,003C,0180,0800,0000,1142
:2578
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:2586
:2587
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:2590
U 1142, 0000,003D,0180,0800,0000,127E
U 1143, 0018,8038,0D80,09F8,0000,12F7
U 12F7, 0F18,0038,C180,0800,0000,12F8
U 12F8, 0500,003C,0380,0800,0000,1144
U 1144, 0000,003D,01E0,0800,0000,100A
:2591
:2592
:2593
:2594
:2595
:2596
U 1145, 0001,003C,0180,0AE8,0000,1146
U 1146, 0000,003D,0180,0800,0000,100B
U 1147, 0001,203C,0180,0A88,0000,1148
U 1148, 0000,003D,0180,0800,0000,115C
U 1149, 0000,003C,0180,0800,0000,114A
:2597
:2598
:2599
:2600
:2601
:2602
:2603
:2604
:2605
:2606
U 114A, 0000,003D,0180,0800,0000,127E
U 114B, 0000,003C,01C0,0A68,0000,114C
U 114C, 0000,003D,0180,0800,0000,100B
:2607
:2608
:2609
    
```

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.PAGE 'TEST 54 NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST'
*****
++
TEST 54 NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST

TEST DESCRIPTION
THIS TEST FLOATS A 1 ACROSS A FIELD OF 0'S THROUGH
EACH BYTE OF THE D REGISTER WHILE PERFORMING A D
REGISTER NIBBLE SWAP IN THE DMX.

LOGIC DESCRIPTION
TESTED HERE ARE THE UDK FUNCTION DECODE LOGIC, THE
DMX NIBBLE SWAP INPUTS AND THE LOAD D SIGNAL.
NOTE THAT ALL THIS LOGIC IS ON THE DBP BOARD.

ERROR DESCRIPTION
EXPECTED D REGISTER
GOT D REGISTER
D REGISTER OPERAND BEFORE SWAP FUNCTION

--
*****
=0
DPT36: NEWTST
NOP
; THE FOLLOWING REGISTER ARE USED DURING THIS TEST:
; R[1] IS THE EXPECTED RESULT
; R[0D] IS THE D OPERAND
; R[8] IS A COUNTER
; NOTE THAT A SUBROUTINE IS USED TO EXECUTE
; THE BYTE SWAP AND CHECK THE RESULT.
////////////////////////////////////
+
SUBTEST 1
FIRST TEST THE LOW BYTE.
-
=0
SUBTEST
RC[0F] K[.3],DT/BYTE
D 0,ALO K[.FFFF]
D-D.LEFT,S1/7
CALL,J/SHQLFT16,Q_D
; R[1] IS USED TO COMPUTE
; THE EXPECTED RESULT.

R[0D] D
CALL,J/SHQLFT8
R[1] Q
CALL,J/DPT36S
; GO TO THE SUBROUTINE TO
; EXECUTE THE TEST.
NOP
////////////////////////////////////
+
SUBTEST 2
TEST BYTE TWO
-
=0
SUBTEST
Q R[0D]
CALL,J/SHQLFT8
    
```

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U 114D, 0001,203C,0180,0A88,0000,114E :2610      RC1]_Q
U 114E, 0000,003D,0180,0800,0000,115C :2611      CALL,J/DPT36S
U 114F, 0000,003C,0180,0800,0000,1150 :2612      NOP
:2613      ;////////////////////
:2614      ;+
:2615      ; SUBTEST          3
:2616      ; TEST BYTE THREE
:2617      ; -
U 1150, 0000,003D,0180,0800,0000,127E :2618      =0      SUBTEST
U 1151, 0000,003C,01F8,0800,0000,12F9 :2619      Q_0
U 12F9, 0000,003C,03A8,0800,0000,1152 :2620      Q-Q.LEFT,S1/7
U 1152, 0000,003D,0180,0800,0000,100B :2621      =0      CALL,J/SHQLFT8
U 1153, 0001,203C,0180,0A88,0000,1156 :2622      RC1]_Q
U 1156, 0000,003D,0180,0800,0000,115C :2623      =0      CALL,J/DPT36S
U 1157, 0000,003C,0180,0800,0000,1158 :2624      NOP
:2625      ;////////////////////
:2626      ;+
:2627      ; SUBTEST          4
:2628      ; TEST BYTE FOUR
:2629      ; -
U 1158, 0000,003D,0180,0800,0000,127E :2630      =0      SUBTEST
U 1159, 0000,003C,01F8,0800,0000,12FA :2631      Q_0
U 12FA, 0000,003C,03A8,0800,0000,12FB :2632      Q-Q.LEFT,S1/7
U 12FB, 0001,203C,0180,0A88,0000,115A :2633      RC1]_Q
U 115A, 0000,003D,0180,0800,0000,115C :2634      =0      CALL,J/DPT36S
U 115B, 0000,003C,0180,0800,0000,130A :2635      J/DPT36D
:2636      ; TEST COMPLETED.
:2637      ; SUBROUTINE TO PERFORM TEST
:2638      ;
U 115C, 0F00,003D,0180,0800,0000,1018 :2638      =0      DPT36S: D_0,CALL,J/DCB
U 115D, 0001,003C,0180,0AC0,0000,115E :2639      RC8]_D
U 115E, 0000,003D,0180,0800,0000,1279 :2640      =0      ERLODP
U 115F, 0800,003C,0180,0A68,0000,12FC :2641      DPT36A: D RC0D]
U 12FC, 0001,003C,0180,09E0,0000,12FD :2642      RC[0C]_D
U 12FD, 0000,003C,01C0,0A08,0000,12FE :2643      Q RC1]
U 12FE, 0001,203C,0180,09F0,0000,12FF :2644      RC[0E]_Q
U 12FF, 0B00,003C,0180,0800,0000,1300 :2645      D D.SWAP
U 1300, 001D,2000,0180,0800,0010,1301 :2646      ACU_Q-D,CLK.UBCC
U 1301, 0000,013C,0180,0800,0000,1160 :2647      Z?
U 1160, 0001,003D,0180,09E8,0000,127A :2648      =0      RC[0D]_D,ERROR1
U 1161, 0800,003C,0180,0A68,0000,1302 :2649      D RC0D]
U 1302, 0000,003C,01C0,0A08,0000,1303 :2650      Q RC1]
U 1303, 0000,003C,01A8,0800,0000,1304 :2651      Q-Q.LEFT,S1/ZERO
U 1304, 0500,003C,0180,0800,0000,1305 :2652      D-D.LEFT,S1/ZERO
U 1305, 0001,003C,0180,0AE8,0000,1306 :2653      RC0D]_D
U 1306, 0001,203C,0180,0A88,0000,1307 :2654      RC1]_Q
U 1307, 0000,003C,0180,0A40,0000,1308 :2655      LAB RC8]
U 1308, 0018,0000,0580,0AC0,0010,1309 :2656      RC8]_LA-K[.1],CLK.UBCC
U 1309, 0000,013C,0180,0800,0000,1162 :2657      Z?
U 1162, 0000,003C,0180,0800,0000,115F :2658      =0      J/DPT36A
U 1163, 0000,003E,0180,0800,0000,0001 :2659      RETURN1
U 130A, 0000,003C,0180,0800,0000,1164 :2660      DPT36D: NOP
:2661      ; SEE IF LOOP HAS BEEN
:2662      ; EXECUTED 8 TIMES
:2663      ;
:2664      ; RETURN IF YES

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2661 .PAGE "TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST"
2662 *****
2663 ++
2664 TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST
2665
2666 TEST DESCRIPTION
2667 THIS TEST FLOATS A 0 ACROSS A FIELD OF 1'S THROUGH
2668 EACH BYTE OF THE D REGISTER WHILE PERFORMING A D
2669 REGISTER NIBBLE SWAP IN THE DMX.
2670
2671 LOGIC DESCRIPTION
2672 TESTED HERE ARE THE UDK FUNCTION DECODE LOGIC, THE
2673 DMX NIBBLE SWAP INPUTS AND THE LOAD D SIGNAL.
2674 NOTE THAT ALL THIS LOGIC IS ON THE DBP BOARD.
2675
2676 ERROR DESCRIPTION
2677 EXPECTED D REGISTER
2678 GOT D REGISTER
2679 D REGISTER OPERAND BEFORE SWAP FUNCTION
2680
2681 --
2682 *****
2683 =0
2684 DPT37: NEWTST
2685 NOP
2686 ; THE FOLLOWING REGISTERS ARE USED DURING THIS TEST:
2687 ; R[1] IS THE EXPECTED RESULT
2688 ; R[0D] IS THE D OPERAND
2689 ; R[8] IS A COUNTER
2690 ; NOTE THAT A SUBROUTINE IS USED
2691 ; TO EXECUTE THE BYTE SWAP AND CHECK THE RESULT.
2692 ; //////////////////////////////////////
2693 +
2694 SUBTEST 1
2695 FIRST TEST THE LOW BYTE
2696
2697 =0 SUBTEST
2698 RC[0F] K[.3],DT/BYTE
2699 =0 CALL,J7SHQL16 ; PUT A -1 IN Q.
2700 NOP
2701 =0 CALL,J/SHQL16
2702 D_Q ; Q=D=-1
2703 Q_Q.LEFT,SI/ZERO ; INITIALIZE THE OPERAND AND
2704 D_D.LEFT,SI/ZERO ; EXPECTED RESULT
2705 =0 CALL,J/SHQL16
2706 RC[0D] D
2707 =0 CALL,J/SHQL8
2708 RC[1] Q
2709 =0 CALL,J/DPT37S
2710 NOP
2711 ; //////////////////////////////////////
2712 +
2713 SUBTEST 2
2714 TEST BYTE TWO
2715 -

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U 1164, 0000,003D,0180,0800,0000,1268
U 1165, 0000,003C,0180,0800,0000,1166

U 1166, 0000,003D,0180,0800,0000,127E
U 1167, 0018,8038,0D80,09F8,0000,1168
U 1168, 0000,003D,0180,0800,0000,1040
U 1169, 0000,003C,0180,0800,0000,116A
U 116A, 0000,003D,0180,0800,0000,1040
U 116B, 0C00,003C,0180,0800,0000,130B
U 130B, 0000,003C,01A8,0800,0000,130C
U 130C, 0500,003C,0180,0800,0000,116C
U 116C, 0000,003D,0180,0800,0000,1040
U 116D, 0001,003C,0180,0AE8,0000,116E
U 116E, 0000,003D,0180,0800,0000,1291
U 116F, 0001,203C,0180,0A88,0000,1170
U 1170, 0000,003D,0180,0800,0000,118A
U 1171, 0000,003C,0180,0800,0000,1172

ZZ-ESKAH-V132 TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST
ESKAH21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

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U 1172, 0000,003D,0180,0800,0000,127E :2716 =0 SUBTEST
U 1173, 0000,003C,01C0,0A68,0000,1174 :2717 Q R[0D]
U 1174, 0000,003D,0180,0800,0000,1291 :2718 =0 CALL,J/SHQL8
U 1175, 0001,203C,0180,0A88,0000,1176 :2719 R[1] Q
U 1176, 0000,003D,0180,0800,0000,118A :2720 =0 CALL,J/DPT37S
U 1177, 0000,003C,0180,0800,0000,1178 :2721 NOP
:2722 :////////////////////
:2723 :+
:2724 : SUBTEST 3
:2725 : TEST BYTE THREE
:2726 :-
U 1178, 0000,003D,0180,0800,0000,127E :2727 =0 SUBTEST
U 1179, 0000,003C,0180,0800,0000,117A :2728 NOP
U 117A, 0000,003D,0180,0800,0000,1040 :2729 =0 CALL,J/SHQL16
U 117B, 0000,003C,0180,0800,0000,117C :2730 NOP
U 117C, 0000,003D,0180,0800,0000,1292 :2731 =0 CALL,J/SHQL7
U 117D, 0000,003C,01A8,0800,0000,117E :2732 Q Q.LEFT,SI/ZERO
U 117E, 0000,003D,0180,0800,0000,1291 :2733 =0 CALL,J/SHQL8
U 117F, 0001,203C,0180,0A88,0000,1180 :2734 R[1] Q
U 1180, 0000,003D,0180,0800,0000,118A :2735 =0 CALL,J/DPT37S
U 1181, 0000,003C,0180,0800,0000,1182 :2736 NOP
:2737 :////////////////////
:2738 :+
:2739 : SUBTEST 4
:2740 : TEST BYTE FOUR
:2741 :-
U 1182, 0000,003D,0180,0800,0000,127E :2742 =0 SUBTEST
U 1183, 0000,003C,0180,0800,0000,1184 :2743 NOP
U 1184, 0000,003D,0180,0800,0000,1040 :2744 =0 CALL,J/SHQL16
U 1185, 0000,003C,0180,0800,0000,1186 :2745 NOP
U 1186, 0000,003D,0180,0800,0000,1040 :2746 =0 CALL,J/SHQL16
U 1187, 0000,003C,01A8,0800,0000,130D :2747 Q Q.LEFT,SI/ZERO
U 130D, 0001,203C,0180,0A88,0000,1188 :2748 R[1] Q
U 1188, 0000,003D,0180,0800,0000,118A :2749 =0 CALL,J/DPT37S
U 1189, 0000,003C,0180,0800,0000,131B :2750 J/DPT37D
:2751 : TEST COMPLETED
:2752 : SUBROUTINE USED TO PERFORM TEST
U 118A, 0F00,003D,0180,0800,0000,1018 :2753 =0 DPT37S: D 0,CALL,J/DCB : SET UP COUNTER.
U 118B, 0001,003C,0180,0A00,0000,118C :2754 R[8] D
U 118C, 0000,003D,0180,0800,0000,1279 :2755 =0 ERLOOP : SET UP LOOP ON ERROR
:2756 : ADDRESS
U 118D, 0800,003C,0180,0A68,0000,130E :2757 DPT37A: D R[0D] : SET UP OPERAND
U 130E, 0001,003C,0180,09E0,0000,130F :2758 R[0C] D
U 130F, 0000,003C,01C0,0A08,0000,1310 :2759 Q R[1] : GET EXPECTED RESULT
U 1310, 0801,203C,0180,09F0,0000,1311 :2760 D D.SWAP,R[0E] Q : TEST INSTRUCTION
U 1311, 001D,2000,0180,0800,0010,1312 :2761 ALU_Q-D,CLK.UBC : RESULT CORRECT?
U 1312, 0000,013C,0180,0800,0000,118E :2762 Z?
U 118E, 0001,003D,0180,09E8,0000,127A :2763 =0 R[0D] D,ERROR1 : BYTE SWAP FAILED, DMX
U 118F, 0800,003C,0180,0A68,0000,1313 :2764 D R[0D] : COMPUTE NEXT TEST PATTERN
U 1313, 0000,003C,01C0,0A08,0000,1314 :2765 Q R[1] : AND EXPECTED RESULT
U 1314, 0018,0038,C3A8,0800,0000,1315 :2766 Q Q.LEFT,SI/7,ALU_KC.FFFF]
U 1315, 0500,003C,0380,0800,0000,1316 :2767 D D.LEFT,SI/7
U 1316, 0001,003C,0180,0AE8,0000,1317 :2768 R[0D] D
U 1317, 0001,203C,0180,0A88,0000,1318 :2769 R[1] Q
U 1318, 0000,003C,0180,0A40,0000,1319 :2770 LAB_R[8] : SEE IF LOOP COUNTER IS

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ZZ-ESKAH-V132 TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST K 11
ESKAH21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

SEQ 0136
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U 1319, 0018,0000,0580,0AC0,0010,131A :2771      RE[8]_LA-K[.1],CLK.UBCC ; ZERO.
U 131A, 0000,013C,0180,0800,0000,1190 :2772      Z?
U 1190, 0000,003C,0180,0800,0000,118D :2773      =0      J/DPT37A
U 1191, 0000,003E,0180,0800,0000,0001 :2774      RETURN1      ; IF YES RETURN
U 131B, 0000,003C,0180,0800,0000,1192 :2775      DPT37D: NOP
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:2776 .PAGE 'TEST 56 TEST USI, SHIFT INPUT, USING THE Q REGISTER'
:2777 *****
:2778 ++
:2779 TEST 56 TEST USI, SHIFT INPUT, USING THE Q REGISTER.
:2780
:2781 TEST DESCRIPTION
:2782 EACH USI FUNCTION ON THE Q REGISTE SHIFT INPUT IS
:2783 TRIED HERE. SOME OF THESE SHIFT INPUTS ARE TRIED ASSERTED
:2784 AND DEASSERTED (IF APPLICABLE).
:2785
:2786 LOGIC DESCRIPTION
:2787 THIS IS A TEST OF THE Q REGISTER SHIFT INPUT
:2788 MUX, THE INDIVIDUAL INPUTS TO THIS MUX AND THE MUX'S
:2789 SELECT LINES. THE ACTUAL Q REGISTER SHIFT FUNCTION
:2790 AND THE REGISTER'S CONNECTION TO THE MUX'S OUTPUT
:2791 HAS ALREADY BEEN TESTED.
:2792 THIS MUX IS LOCATED ON THE DAP BOARD AS IS THE USI
:2793 AND UQK FIELD DECODE.
:2794
:2795 ERROR DESCRIPTION
:2796 EXPECTED DATA
:2797 GOT DATA
:2798
:2799 --
:2800 *****
:2801 =0
:2802 DPT38: NEWTST
:2803 D 0
:2804 =0 CALL J/DCA ; GENERATE AND SAVE THE OPERAND.
:2805 RCOD] D
:2806 RC[OF] K[.2]
:2807 //////////////////////////////////////
:2808 +
:2809 SUBTEST 1
:2810 TEST USI= 3
:2811 -
:2812 =0 SUBTEST
:2813 NOP
:2814 =0 ERLOOP
:2815 Q_R[OD],D R[OD]
:2816 D_D.LEFT,S1/ZERO ; COMPUTE EXPECTED RESULT.
:2817 Q-Q.LEFT,S1/ZERO,RC[OD]-D ; TEST INSTRUCTION
:2818 ACU_Q-D,CLK.UBCC ; RESULT CORRECT?
:2819 Z?
:2820 =0 RC[OD]_Q.ERROR1 ; REPORT RESULT INCORRECT.
:2821 NOP
:2822 //////////////////////////////////////
:2823 +
:2824 SUBTEST 2
:2825 TEST USI=4
:2826 -
:2827 =0 SUBTEST
:2828 NOP
:2829 =0 ERLOOP
:2830 D_R[OD],Q_R[OD] ; SET UP OPERANDS

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U 1192, 0000,003D,0180,0800,0000,1268
 U 1193, 0F00,003C,0180,0800,0000,1194
 U 1194, 0000,003D,0180,0800,0000,101A
 U 1195, 0001,003C,0180,0AE8,0000,131C
 U 131C, 0018,0038,0980,09F8,0000,1196

U 1196, 0000,003D,0180,0800,0000,127E
 U 1197, 0000,003C,0180,0800,0000,1198
 U 1198, 0000,003D,0180,0800,0000,1279
 U 1199, 0800,003C,01C0,0A68,0000,131D
 U 131D, 0500,003C,0180,0800,0000,131E
 U 131E, 0001,003C,01A8,09E8,0000,131F
 U 131F, 001D,2000,0180,0800,0010,1320
 U 1320, 0000,013C,0180,0800,0000,119A
 U 119A, 0001,203D,0180,09E8,0000,127A
 U 119B, 0000,003C,0180,0800,0000,119C

U 119C, 0000,003D,0180,0800,0000,127E
 U 119D, 0000,003C,0180,0800,0000,119E
 U 119E, 0000,003D,0180,0800,0000,1279
 U 119F, 0800,003C,01C0,0A68,0000,1321

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U 1321, 0500,003C,0180,0800,0000,1322 :2831      D D.LEFT,SI/ZERO      ; GENERATE THE EXPECTED RESULT
U 1322, 0001,003C,0180,09F0,0000,1323 :2832      RC[OE] D
U 1323, 0000,003C,0228,0800,0000,1324 :2833      Q Q.LEFT,SI/4      ; TEST INSTRUCTION.
U 1324, 001D,2000,0180,0800,0010,1325 :2834      ACU_Q-D,CLK.UBCC    ; RESULT CORRECT?
U 1325, 0000,013C,0180,0800,0000,11A0 :2835      Z?
U 11A0, 0001,203D,0180,09E8,0000,127A :2836      RC[OD]_Q,ERROR1      ; REPORT RESULT INCORRECT.
U 11A1, 0000,003C,0180,0800,0000,11A2 :2837      NOP
:2838      ;////////////////////////////////////
:2839      ;+
:2840      ; SUBTEST          3
:2841      ; TEST USI=6
:2842      ;-
U 11A2, 0000,003D,0180,0800,0000,127E :2843      =0      SUBTEST
U 11A3, 0000,003C,0180,0800,0000,11A4 :2844      NOP
U 11A4, 0000,003D,0180,0800,0000,1279 :2845      =0      ERLOOP
U 11A5, 0800,003C,01C0,0A68,0000,1326 :2846      D R[OD],Q R[OD]      ; SET UP OPERAND
U 1326, 0500,003C,0180,0800,0000,1327 :2847      D-D.LEFT,SI/ZERO    ; COMPUTE EXPECTED RESULT
U 1327, 0001,003C,0180,09F0,0000,1328 :2848      RC[OE] D
U 1328, 0000,003C,0328,0800,0000,1329 :2849      Q Q.LEFT,SI/6      ; TEST INSTRUCTION
U 1329, 001D,2000,0180,0800,0010,132A :2850      ACU_Q-D,CLK.UBCC    ; RESULT CORRECT?
U 132A, 0000,013C,0180,0800,0000,11A6 :2851      Z?
U 11A6, 0001,203D,0180,09E8,0000,127A :2852      =0      ERROR1,RC[OD]_Q ; RESULT INCORRECT.
U 11A7, 0000,003C,0180,0800,0000,11A8 :2853      NOP
:2854      ;////////////////////////////////////
:2855      ;+
:2856      ; SUBTEST          4
:2857      ; TEST USI=7
:2858      ;-
U 11A8, 0000,003D,0180,0800,0000,127E :2859      =0      SUBTEST
U 11A9, 0000,003C,0180,0800,0000,11AA :2860      NOP
U 11AA, 0000,003D,0180,0800,0000,1279 :2861      =0      ERLOOP
U 11AB, 0800,003C,01C0,0A68,0000,132B :2862      D R[OD],Q R[OD]      ; SET UP OPERAND
U 132B, 0018,0038,0180,0800,0000,132C :2863      ACU_K[FFFF]
U 132C, 0500,003C,0380,0800,0000,132D :2864      D D.LEFT,SI/7      ; COMPUTE EXPECTED RESULT.
U 132D, 0001,003C,0180,09F0,0000,132E :2865      RC[OE] D
U 132E, 0000,003C,03A8,0800,0000,132F :2866      Q Q.LEFT,SI/7      ; TEST INSTRUCTION
U 132F, 001D,2000,0180,0800,0010,1330 :2867      ACU_Q-D,CLK.UBCC    ; RESULT CORRECT?
U 1330, 0000,013C,0180,0800,0000,11AC :2868      Z?
U 11AC, 0001,203D,0180,09E8,0000,127A :2869      =0      ERROR1,RC[OD]_Q
U 11AD, 0000,003C,0180,0800,0000,11AE :2870      NOP
:2871      ;////////////////////////////////////
:2872      ;+
:2873      ; SUBTEST          5
:2874      ; USI=1, SHIFT Q31 INTO Q, Q31=0
:2875      ;-
U 11AE, 0000,003D,0180,0800,0000,127E :2876      =0      SUBTEST
U 11AF, 0000,003C,0180,0800,0000,11B0 :2877      NOP
U 11B0, 0000,003D,0180,0800,0000,1279 :2878      =0      ERLOOP
U 11B1, 0800,003C,01C0,0A68,0000,1331 :2879      D R[OD],Q R[OD]      ; SET UP THE OPERAND
U 1331, 0500,003C,0180,0800,0000,1332 :2880      D-D.LEFT,SI/ZERO    ; COMPUTE EXPECTED RESULT
U 1332, 0001,003C,0180,09F0,0000,1333 :2881      RC[OE] D
U 1333, 0000,003C,00A8,0800,0000,1334 :2882      Q Q.LEFT,SI/1      ; TEST INSTRUCTION
U 1334, 001D,2000,0180,0800,0010,1335 :2883      ACU_Q-D,CLK.UBCC    ; RESULT CORRECT?
U 1335, 0000,013C,0180,0800,0000,11B2 :2884      Z?
U 11B2, 0001,203D,0180,09E8,0000,127A :2885      =0      ERROR1,RC[OD]_Q ; RESULT INCORRECT.

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U 11B3, 0000,003C,0180,0800,0000,11B4 :2886      NOP
:2887      :////////////////////
:2888      :+
:2889      : SUBTEST          6
:2890      : USI=2, D31=0
:2891      : -
:2892      : =0      SUBTEST
:2893      :          NOP
:2894      : =0      ERLOOP
:2895      :          D_R[OD],Q_R[OD]      : SET UP OPERAND
:2896      :          D-D.LEFT,S1/ZERO      : COMPUTE EXPECTED RESULT
:2897      :          RC[OE]_D
:2898      :          Q_Q.LEFT,S1/2      : TEST INSTRUCTION
:2899      :          ALU_Q-D,CLK.UBCC      : RESULT CORRECT?
:2900      :          Z?
:2901      : =0      ERROR1,RC[OD]_Q      : RESULT INCORRECT.
:2902      :          NOP
:2903      : //////////////////
:2904      : +
:2905      : SUBTEST          7
:2906      : USI=0, ALU CARRY 31=0
:2907      : -
:2908      : =0      SUBTEST
:2909      :          NOP
:2910      : =0      ERLOOP
:2911      :          D_R[OD],Q_R[OD]      : SET UP OPERAND
:2912      :          D-D.LEFT,S1/ZERO      : COMPUTE EXPECTED RESULT
:2913      :          RC[OE]_D
:2914      :          : TEST INSTRUCTION
:2915      :          AMX/RAMX.0XT,DT/LONG,KMX/ZERO,BMX/KMX,ALU/A+B,Q_Q.LEFT,S1/0
:2916      :          ALU_Q-D,CLK.UBCC      : RESULT CORRECT?
:2917      :          Z?
:2918      : =0      ERROR1,RC[OD]_Q      : RESULT INCORRECT.
:2919      :          NOP
:2920      : //////////////////
:2921      : +
:2922      : SUBTEST          8
:2923      : USI=5, ALU CARRY 31=0
:2924      : -
:2925      : =0      SUBTEST
:2926      :          NOP
:2927      : =0      ERLOOP
:2928      :          D_R[OD],Q_R[OD]      : SET UP OPERAND
:2929      :          D-D.LEFT,S1/ZERO      : COMPUTE EXPECTED RESULT
:2930      :          RC[OE]_D
:2931      :          : TEST INSTRUCTION
:2932      :          AMX/RAMX.0XT,DT/LONG,KMX/ZERO,BMX/KMX,ALU/A+B,Q_Q.LEFT,S1/5
:2933      :          ALU_Q-D,CLK.UBCC      : RESULT CORRECT?
:2934      :          Z?
:2935      : =0      ERROR1,RC[OD]_Q      : RESULT INCORRECT.
:2936      :          NOP
:2937      : //////////////////
:2938      : +
:2939      : SUBTEST          9
:2940      : USI=1, Q31=1
  
```



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:2941
U 11C6, 0000,003D,0180,0800,0000,127E :2942 :-
U 11C7, 0000,003C,0180,0800,0000,11C8 :2943 =0 SUBTEST
U 11C8, 0000,003D,0180,0800,0000,1279 :2944 NOP
U 11C9, 0800,003C,01C0,0A68,0000,1345 :2945 ERLOOP
U 1345, 0000,003C,0380,0800,0000,11CA :2946 D_R[OD],Q_R[OD] ; SET UP OPERAND
U 11CA, 0F00,003D,0180,0800,0000,1018 :2947 Q_Q.RIGHT,SI/7
U 11CB, 0001,003C,0180,09F0,0000,1346 :2948 D_0,CALL,J/DCB ; COMPUTE EXPECTED RESULT.
U 1346, 0000,003C,00A8,0800,0000,1347 :2949 RC[OE] D
U 1347, 001D,2000,0180,0800,0010,1348 :2950 Q_Q.LEFT,SI/1 ; TEST INSTRUCTION
U 1348, 0000,013C,0180,0800,0000,11CC :2951 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 11CC, 0001,203D,0180,09E8,0000,127A :2952 Z?
U 11CD, 0000,003C,0180,0800,0000,11CE :2953 =0 ERROR1,RC[OD]_Q ; RESULT INCORRECT.
:2954 NOP
:2955 +
:2956 SUBTEST A
:2957 USI=2, D31=1
:2958 :-
U 11CE, 0000,003D,0180,0800,0000,127E :2959 =0 SUBTEST
U 11CF, 0000,003C,0180,0800,0000,11D0 :2960 NOP
U 11D0, 0000,003D,0180,0800,0000,1279 :2961 ERLOOP
U 11D1, 0800,003C,01C0,0A68,0000,1349 :2962 D_R[OD],Q_R[OD] ; SET UP OPERAND
U 1349, 0018,0038,C180,0800,0000,134A :2963 ALU_KC.FFFF]
U 134A, 0600,003C,0380,0800,0000,134B :2964 D_D.RIGHT,SI/7
U 134B, 0000,003C,0128,0800,0000,134C :2965 Q_Q.LEFT,SI/2 ; TEST INSTRUCTION
U 134C, 0018,0038,0980,0800,0000,134D :2966 ALU_KC.2]
U 134D, 0100,003C,0380,0800,0000,134E :2967 D_D.LEFT2,SI/7 ; COMPUTE EXPECTED RESULT
U 134E, 0001,003C,0180,09F0,0000,134F :2968 RC[OE] D
U 134F, 001D,2000,0180,0800,0010,1350 :2969 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 1350, 0000,013C,0180,0800,0000,11D2 :2970 Z?
U 11D2, 0001,203D,0180,09E8,0000,127A :2971 =0 ERROR1,RC[OD]_Q ; RESULT INCORRECT.
U 11D3, 0000,003C,0180,0800,0000,11D4 :2972 NOP
:2973 +
:2974 SUBTEST B
:2975 USI=0, ALU CARRY 31=1
:2976 :-
U 11D4, 0000,003D,0180,0800,0000,127E :2977 =0 SUBTEST
U 11D5, 0000,003C,0180,0800,0000,11D6 :2978 NOP
U 11D6, 0000,003D,0180,0800,0000,1279 :2979 ERLOOP
U 11D7, 0F00,003C,0180,0800,0000,1351 :2980 D_0
U 1351, 0819,0000,0580,0800,0000,1352 :2981 D_D-K[.1]
U 1352, 0000,003C,01C0,0A68,0000,1353 :2982 Q_R[OD] ; SET UP OPERAND
U 1353, 0819,0014,0428,0800,0000,1354 :2983 D_D+K[.1],Q_Q.LEFT,SI/0 ; TEST INSTRUCTION
U 1354, 0800,003C,0180,0A68,0000,1355 :2984 D_R[OD] ; COMPUTE EXPECTED RESULT
U 1355, 0018,0038,C180,0800,0000,1356 :2985 ALU_KC.FFFF]
U 1356, 0500,003C,0380,0800,0000,1357 :2986 D_D.LEFT,SI/7
U 1357, 0001,003C,0180,09F0,0000,1358 :2987 RC[OE] D
U 1358, 001D,2000,0180,0800,0010,1359 :2988 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 1359, 0000,013C,0180,0800,0000,11D8 :2989 Z?
U 11D8, 0001,203D,0180,09E8,0000,127A :2990 =0 ERROR1,RC[OD]_Q ; INCORRECT.
U 11D9, 0000,003C,0180,0800,0000,11DA :2991 NOP
:2992 +
:2993 SUBTEST C
:2994
:2995

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:2996 ; USI=5, ALU CARRY 31=1
:2997 :-
:2998 =0 SUBTEST
:2999 NOP
:3000 =0 ERLOOP
:3001 D_0
:3002 D-D-K[.1]
:3003 Q-R[OD] ; SET UP OPERAND
:3004 D-D+K[.1],Q-Q.LEFT,S1/5 ; TEST INSTRUCTION
:3005 D-R[OD] ; COMPUTE EXPECTED RESULT
:3006 A[U_K[FFFF]]
:3007 D-D.LEFT,S1/7
:3008 R[OE] D
:3009 ALU-Q-D,CLK.UBCC ; RESULT CORRECT?
:3010 Z?
:3011 =0 ERROR1,R[OD],Q ; INCORRECT.
:3012 NOP
  
```

U 11DA,	0000,003D,0180,0800,0000,127E	:2996		
U 11DB,	0000,003C,0180,0800,0000,11DC	:2997		
U 11DC,	0000,003D,0180,0800,0000,1279	:2998	=0	SUBTEST
U 11DD,	0F00,003C,0180,0800,0000,135A	:2999		NOP
U 135A,	0819,0000,0580,0800,0000,135B	:3000	=0	ERLOOP
U 135B,	0000,003C,01C0,0A68,0000,135C	:3001		D_0
U 135C,	0819,0014,06A8,0800,0000,135D	:3002		D-D-K[.1]
U 135D,	0800,003C,0180,0A68,0000,135E	:3003		Q-R[OD]
U 135E,	0018,0038,C180,0800,0000,135F	:3004		D-D+K[.1],Q-Q.LEFT,S1/5
U 135F,	0500,003C,0380,0800,0000,1360	:3005		D-R[OD]
U 1360,	0001,003C,0180,09F0,0000,1361	:3006		A[U_K[FFFF]]
U 1361,	001D,2000,0180,0800,0010,1362	:3007		D-D.LEFT,S1/7
U 1362,	0000,013C,0180,0800,0000,11DE	:3008		R[OE] D
U 11DE,	0001,203D,0180,09E8,0000,127A	:3009		ALU-Q-D,CLK.UBCC
U 11DF,	0000,003C,0180,0800,0000,11E0	:3010		Z?
		:3011	=0	ERROR1,R[OD],Q
		:3012		NOP

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3013 .PAGE 'TEST 57 TEST USI, SHIFT INPUT, USING THE D REGISTER'
3014 *****
3015 ++
3016 TEST 57 TEST USI, WITH D REGISTER
3017
3018 TEST DESCRIPTION
3019 EACH USI FUNCTION ON THE D REGISTER IS TRIED HERE.
3020 SOME OF THESE SHIFT INPUTS ARE TRIED BOTH ASSERTED
3021 AND DEASSERTED.
3022
3023 LOGIC DESCRIPTION
3024 THIS IS A TEST OF THE D REGISTER SHIFT INPUT
3025 MUX, THE INDIVIDUAL INPUTS TO THIS MUX AND THE MUX'S
3026 SELECT LINES. THE ACTUAL D REGISTER SHIFT FUNCTION AND THIS
3027 REGISTER'S CONNECT TO THE SHIFT MUX HAS ALREADY BEEN
3028 TESTED. THIS MUX IS LOCATED ON THE DAP BOARD.
3029
3030 ERROR DESCRIPTION
3031 EXPECTED RESULT
3032 GOT RESULT RESULT
3033
3034 --
3035 *****
3036 =0
3037 DPT39: NEWTST
3038 RC[0F] K[.2]
3039 =0 D 0,CAL,J/DCA
3040 RC[0D] D,Q D
3041 ;//////////
3042 +
3043 SUBTEST 1
3044 USI=0, Q<31>=0
3045 -
3046 =0 SUBTEST
3047 NOP
3048 =0 ERLOOP
3049 D RC[0D],Q RC[0D] ; SET UP THE OPERAND
3050 Q-Q.LEFT,S1/ZERO ; COMPUTE EXPECTED RESULT
3051 RC[0E] Q
3052 D D.LEFT,S1/0 ; TEST INSTRUCTION, Q31=0
3053 ACU_Q-D,CLK.UBCC ; RESULT CORRECT?
3054 Z?
3055 =0 ERROR1,RC[0D]_D
3056 NOP
3057 ;//////////
3058 +
3059 SUBTEST 2
3060 USI=1, Q<00>=0
3061 -
3062 =0 SUBTEST
3063 NOP
3064 =0 ERLOOP
3065 D RC[0D],Q RC[0D] ; SET UP THE OPERAND
3066 Q-Q.LEFT,S1/ZERO ; COMPUTE THE EXPECTED RESULT
3067 D D.LEFT,S1/1 ; TEST INSTRUCTION
    
```

U 11E0, 0000,003D,0180,0800,0000,1268
 U 11E1, 0018,0038,0980,09F8,0000,11E2
 U 11E2, 0F00,003D,0180,0800,0000,101A
 U 11E3, 0001,003C,01E0,0AE8,0000,11E4

U 11E4, 0000,003D,0180,0800,0000,127E
 U 11E5, 0000,003C,0180,0800,0000,11E6
 U 11E6, 0000,003D,0180,0800,0000,1279
 U 11E7, 0800,003C,01C0,0A68,0000,1363
 U 1363, 0000,003C,01A8,0800,0000,1364
 U 1364, 0001,203C,0180,09F0,0000,1365
 U 1365, 0500,003C,0000,0800,0000,1366
 U 1366, 001D,2000,0180,0800,0010,1367
 U 1367, 0000,013C,0180,0800,0000,11E8
 U 11E8, 0001,003D,0180,09E8,0000,127A
 U 11E9, 0000,003C,0180,0800,0000,11EA

U 11EA, 0000,003D,0180,0800,0000,127E
 U 11EB, 0000,003C,0180,0800,0000,11EC
 U 11EC, 0000,003D,0180,0800,0000,1279
 U 11ED, 0800,003C,01C0,0A68,0000,1368
 U 1368, 0000,003C,01A8,0800,0000,1369
 U 1369, 0500,003C,0080,0800,0000,136A

```

U 136A, 001D,2000,0180,0800,0010,136B :3068      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 136B, 0000,013C,0180,0800,0000,11EE :3069      Z?
U 11EE, 0001,003D,0180,09E8,0000,127A :3070      =0      ERROR1,RC[OD]_D
U 11EF, 0000,003C,0180,0800,0000,11F0 :3071      NOP
:3072      ;////////////////////////////////////
:3073      ;+
:3074      ; SUBTEST          3
:3075      ; USI=2
:3076      ;-
U 11F0, 0000,003D,0180,0800,0000,127E :3077      =0      SUBTEST
U 11F1, 0000,003C,0180,0800,0000,11F2 :3078      NOP
U 11F2, 0000,003D,0180,0800,0000,1279 :3079      =0      ERLOOP
U 11F3, 0800,003C,01C0,0A68,0000,136C :3080      D_R[OD],Q_R[OD]      ; SET UP THE OPERAND
U 136C, 0000,003C,01A8,0800,0000,136D :3081      Q_Q.LEFT,SI/ZERO      ; COMPUTE THE EXPECTED RESULT
U 136D, 0500,003C,0100,0800,0000,136E :3082      D_D.LEFT,SI/2      ; TEST INSTRUCTION
U 136E, 001D,2000,0180,0800,0010,136F :3083      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 136F, 0000,013C,0180,0800,0000,11F4 :3084      Z?
U 11F4, 0001,003D,0180,09E8,0000,127A :3085      =0      ERROR1,RC[OD]_D
U 11F5, 0000,003C,0180,0800,0000,11F6 :3086      NOP
:3087      ;////////////////////////////////////
:3088      ;+
:3089      ; SUBTEST          4
:3090      ; USI=3
:3091      ;-
U 11F6, 0000,003D,0180,0800,0000,127E :3092      =0      SUBTEST
U 11F7, 0000,003C,0180,0800,0000,11F8 :3093      NOP
U 11F8, 0000,003D,0180,0800,0000,1279 :3094      =0      ERLOOP
U 11F9, 0800,003C,01C0,0A68,0000,1370 :3095      D_R[OD],Q_R[OD]      ; SET UP THE OPERAND
U 1370, 0000,003C,01A8,0800,0000,1371 :3096      Q_Q.LEFT,SI/ZERO      ; COMPUTE THE EXPECTED RESULT
U 1371, 0500,003C,0180,0800,0000,1372 :3097      D_D.LEFT,SI/ZERO      ; TEST INSTRUCTION
U 1372, 001D,2000,0180,0800,0010,1373 :3098      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 1373, 0000,013C,0180,0800,0000,11FA :3099      Z?
U 11FA, 0001,003D,0180,09E8,0000,127A :3100      =0      ERROR1,RC[OD]_D
U 11FB, 0000,003C,0180,0800,0000,11FC :3101      NOP
:3102      ;////////////////////////////////////
:3103      ;+
:3104      ; SUBTEST          5
:3105      ; USI=4
:3106      ;-
U 11FC, 0000,003D,0180,0800,0000,127E :3107      =0      SUBTEST
U 11FD, 0000,003C,0180,0800,0000,11FE :3108      NOP
U 11FE, 0000,003D,0180,0800,0000,1279 :3109      =0      ERLOOP
U 11FF, 0800,003C,01C0,0A68,0000,1374 :3110      D_R[OD],Q_R[OD]      ; SET UP THE OPERAND
U 1374, 0000,003C,01A8,0800,0000,1375 :3111      Q_Q.LEFT,SI/ZERO      ; COMPUTE THE EXPECTED RESULT
U 1375, 0500,003C,0200,0800,0000,1376 :3112      D_D.LEFT,SI/4      ; TEST INSTRUCTION
U 1376, 001D,2000,0180,0800,0010,1377 :3113      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 1377, 0000,013C,0180,0800,0000,1200 :3114      Z?
U 1200, 0001,003D,0180,09E8,0000,127A :3115      =0      ERROR1,RC[OD]_D
U 1201, 0000,003C,0180,0800,0000,1202 :3116      NOP
:3117      ;////////////////////////////////////
:3118      ;+
:3119      ; SUBTEST          6
:3120      ; USI=5, Q31=0
:3121      ;-
U 1202, 0000,003D,0180,0800,0000,127E :3122      =0      SUBTEST

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U 1203, 0000,003C,0180,0800,0000,1204 :3123 NOP
U 1204, 0000,003D,0180,0800,0000,1279 :3124 =0 ERLOOP
U 1205, 0800,003C,01C0,0A68,0000,1378 :3125 D_R[OD],Q_R[OD] ; SET UP THE OPERAND
U 1378, 0000,003C,01A8,0800,0000,1379 :3126 Q-Q.LEFT,SI/ZERO ; COMPUTE THE EXPECTED RESULT
U 1379, 0001,203C,0180,0A88,0000,137A :3127 R[1] Q
U 137A, 0500,003C,0280,0800,0000,137B :3128 D_D.LEFT,SI/5 ; TEST INSTRUCTION
U 137B, 001D,2000,0180,0800,0010,137C :3129 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 137C, 0000,013C,0180,0800,0000,1206 :3130 Z?
U 1206, 0001,003D,0180,09E8,0000,127A :3131 =0 ERROR1,R[OD]_D
U 1207, 0000,003C,0180,0800,0000,1208 :3132 NOP
:3133 :////////////////////
:3134 :+
:3135 : SUBTEST 7
:3136 : USI=0 Q31=1
:3137 :-
U 1208, 0000,003D,0180,0800,0000,127E :3138 =0 SUBTEST
U 1209, 0000,003C,0180,0800,0000,120A :3139 NOP
U 120A, 0000,003D,0180,0800,0000,1279 :3140 =0 ERLOOP
U 120B, 0800,003C,01C0,0A68,0000,137D :3141 D_R[OD],Q_R[OD] ; SET UP THE OPERAND
U 137D, 0600,003C,0180,0800,0000,137E :3142 D_D.RIGHT,SI/ZERO
U 137E, 0000,003C,0380,0800,0000,137F :3143 Q-Q.RIGHT,SI/7
U 137F, 0500,003C,0000,0800,0000,1380 :3144 D_D.LEFT,SI/0 ; TEST INSTRUCTION
U 1380, 0000,003C,03A8,0800,0000,1381 :3145 Q-Q.LEFT,SI/7 ; COMPUTE EXPECTED RESULT
U 1381, 0001,203C,0180,09F0,0000,1382 :3146 R[OE] Q
U 1382, 001D,2000,0180,0800,0010,1383 :3147 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 1383, 0000,013C,0180,0800,0000,120C :3148 Z?
U 120C, 0001,003D,0180,09E8,0000,127A :3149 =0 ERROR1,R[OD]_D
U 120D, 0000,003C,0180,0800,0000,120E :3150 NOP
:3151 :////////////////////
:3152 :+
:3153 : SUBTEST 8
:3154 : USI=5, Q31=1
:3155 :-
U 120E, 0000,003D,0180,0800,0000,127E :3156 =0 SUBTEST
U 120F, 0000,003C,0180,0800,0000,1210 :3157 NOP
U 1210, 0000,003D,0180,0800,0000,1279 :3158 =0 ERLOOP
U 1211, 0800,003C,01C0,0A68,0000,1384 :3159 D_R[OD],Q_R[OD] ; SET UP OPERAND
U 1384, 0600,003C,0180,0800,0000,1385 :3160 D_D.RIGHT,SI/ZERO
U 1385, 0000,003C,0380,0800,0000,1386 :3161 Q-Q.RIGHT,SI/7
U 1386, 0500,003C,0000,0800,0000,1387 :3162 D_D.LEFT,SI/0 ; TEST INSTRUCTION
U 1387, 0000,003C,03A8,0800,0000,1388 :3163 Q-Q.LEFT,SI/7 ; COMPUTE EXPECTED RESULT
U 1388, 0001,203C,0180,09F0,0000,1389 :3164 R[OE] Q
U 1389, 001D,2000,0180,0800,0010,138A :3165 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 138A, 0000,013C,0180,0800,0000,1212 :3166 Z?
U 1212, 0001,003D,0180,09E8,0000,127A :3167 =0 ERROR1,R[OD]_D
U 1213, 0000,003C,0180,0800,0000,1214 :3168 NOP
:3169 :////////////////////
:3170 :+
:3171 : SUBTEST 9
:3172 : USI=1, Q<00>=1
:3173 :-
U 1214, 0000,003D,0180,0800,0000,127E :3174 =0 SUBTEST
U 1215, 0000,003C,0180,0800,0000,1216 :3175 NOP
U 1216, 0000,003D,0180,0800,0000,1279 :3176 =0 ERLOOP
U 1217, 0800,003C,01C0,0A68,0000,138B :3177 D_R[OD],Q_R[OD] ; SET UP OPERAND

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U 138B, 0000,003C,03A8,0800,0000,138C :3178      Q Q.LEFT,SI/7      : COMPUTE EXPECTED RESULT
U 138C, 0001,203C,0180,09F0,0000,138D :3179      RC[OE] Q
U 138D, 0500,003C,0080,0800,0000,138E :3180      D D.LEFT,SI/1      : TEST INSTRUCTION
U 138E, 001D,2000,0180,0800,0010,138F :3181      ACU_Q-D,CLK.UBCC    : RESULT CORRECT?
U 138F, 0000,013C,0180,0800,0000,1218 :3182      Z?
U 1218, 0001,003D,0180,09E8,0000,127A :3183      ERROR1,RC[OD]_D
U 1219, 0000,003C,0180,0800,0000,121A :3184      NOP
:3185      :////////////////////
:3186      :+
:3187      : SUBTEST          A
:3188      : USI=6, ALU 00/01=0/0
:3189      : -
:3190      : SUBTEST
:3191      : NOP
:3192      : ERLOOP
:3193      : D_R[OD],Q_R[OD]      : SET UP OPERAND
:3194      : Q-Q.LEFT2,SI/ZERO    : COMPUTE EXPECTED RESULT
:3195      : RC[OE] Q
:3196      : D D.LEFT2,SI/6      : TEST INSTRUCTION
:3197      : ACU_Q-D,CLK.UBCC    : RESULT CORRECT?
:3198      : Z?
:3199      : ERROR1,RC[OD]_D
:3200      : NOP
:3201      :////////////////////
:3202      :+
:3203      : SUBTEST          B
:3204      : USI=6, ALU 00/01=1/1
:3205      : -
:3206      : SUBTEST
:3207      : NOP
:3208      : ERLOOP
:3209      : D_R[OD],Q_R[OD]      : SET UP OPERAND
:3210      : Q-Q.LEFT2,SI/7      : COMPUTE EXPECTED RESULT
:3211      : RC[OE] Q
:3212      : D D.LEFT2,SI/6      : TEST INSTRUCTION
:3213      : ACU_Q-D,CLK.UBCC    : RESULT CORRECT?
:3214      : Z?
:3215      : ERROR1,RC[OD]_D
:3216      : NOP
:3217      :////////////////////
:3218      :+
:3219      : SUBTEST          C
:3220      : USI=6, ALU 00/01=0/1
:3221      : -
:3222      : SUBTEST
:3223      : NOP
:3224      : ERLOOP
:3225      : D_R[OD],Q_R[OD]      : SET UP OPERAND
:3226      : Q-Q.LEFT,SI/7      : COMPUTE EXPECTED RESULT
:3227      : Q-Q.LEFT,SI/ZERO
:3228      : RC[OE] Q
:3229      : ALU_K[1]
:3230      : D D.LEFT2,SI/6      : TEST INSTRUCTION
:3231      : ACU_Q-D,CLK.UBCC    : RESULT CORRECT?
:3232      : Z?
    
```

```

U 122A, 0001,003D,0180,09E8,0000,127A :3233 =0 ERROR1,RC[0D]_D
U 122B, 0000,003C,0180,0800,0000,122C :3234 NOP
:3235 :////////////////////
:3236 :+
:3237 : SUBTEST D
:3238 : USI=6, ALU 00/01=1/0
:3239 :-
U 122C, 0000,003D,0180,0800,0000,127E :3240 =0 SUBTEST
U 122D, 0000,003C,0180,0800,0000,122E :3241 NOP
U 122E, 0000,003D,0180,0800,0000,1279 :3242 =0 ERLOOP
U 122F, 0800,003C,01C0,0A68,0000,13A1 :3243 D_R[0D],Q_R[0D] ; SET UP OPERAND
U 13A1, 0000,003C,01A8,0800,0000,13A2 :3244 Q_Q.LEFT,S1/ZERO
U 13A2, 0000,003C,03A8,0800,0000,13A3 :3245 Q_Q.LEFT,S1/7 ; COMPUTE EXPECTED RESULT
U 13A3, 0001,203C,0180,09F0,0000,13A4 :3246 RC[0E]_Q
U 13A4, 0018,0038,0980,0800,0000,13A5 :3247 ALU_K[-2]
U 13A5, 0100,003C,0300,0800,0000,13A6 :3248 D_D.LEFT2,S1/6 ; TEST INSTRUCTION
U 13A6, 001D,2000,0180,0800,0010,13A7 :3249 ACU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 13A7, 0000,013C,0180,0800,0000,1230 :3250 Z?
U 1230, 0001,003D,0180,09E8,0000,127A :3251 =0 ERROR1,RC[0D]_D
U 1231, 0000,003C,0180,0800,0000,1232 :3252 NOP
    
```

```

:3253 .PAGE 'TEST 58 AMX TEST'
:3254 *****
:3255 **
:3256 TEST 58 AMX TEST
:3257
:3258 TEST DESCRIPTION
:3259 THIS IS A TEST OF ALL THE AMX FUNCTIONS AND INPUT
:3260 SELECT CONDITION EXCEPT THE LA INPUT (WHICH IS TEST
:3261 ELSE WHERE). EACH OF THE FUNCTIONS IS TRIED WITH
:3262 THE DATA PATTERNS GENERATED BY FLOATING A 1 ACROSS
:3263 0'S AND A 0 ACROSS 1'S.
:3264 SUBTEST 1 TESTS THE FUNCTION AMX/RAMX.SXT,DT/LONG.
:3265 SUBTEST 2 TESTS THE FUNCTION AMX/RAMX.SXT,DT/WORD.
:3266 SUBTEST 3 TESTS THE FUNCTION AMX/RAMX.SXT,DT/BYTE.
:3267 SUBTEST 4 TESTS THE FUNCTION AMX/RAMX.OXT,DT/LONG.
:3268 SUBTEST 5 TESTS THE FUNCTION AMX/RAMX.OXT,DT/WORD.
:3269 SUBTEST 6 TESTS THE FUNCTION AMX/RAMX.OXT,DT/BYTE.
:3270
:3271 LOGIC DESCRIPTION
:3272 THIS IS A TEST OF THE AMX AND THE AMX SELECTION LOGIC.
:3273 THE AMX SELECTION AND CONTROL LOGIC IS ON DAP. THESE
:3274 CONTROL SIGNALS ARE GENERATED BY BOTH THE AMX CONTROL
:3275 AND THE DATA TYPE FIELDS OF THE MICRO INSTRUCTION.
:3276 IF THE CONTROL LINES ARE NOT CORRECT THEN DAP IS
:3277 AT FAULT. IF THE CONTROL LINES ARE CORRECT AND AN ERROR IS
:3278 DETECTED THEN ONE OF THE DATA PATH BIT SLICES IS AT FAULT.
:3279 THE BIT SLICES ARE PARTITIONED THUS:
:3280 BITS <07:00> ARE ON DCP
:3281 BITS <15:08> ARE ON DDP
:3282 BITS <31:16> ARE ON DEP
:3283 CAREFUL EXAMINATION OF THE EXPECTED AND THE RECIEVED
:3284 DATA SHOULD INDICATE WHICH BIT SLICE IS THE CAUSE OF THE
:3285 ERROR
:3286
:3287 ERROR DESCRIPTION
:3288 EXPECTED RESULT
:3289 GOT RESULT
:3290 OPERAND
:3291 OPERATION INVOLVED WITH FAILURE AS GIVEN BY THIS TABLE:
:3292 5 AMX/RAMX.SXT,DT/LONG
:3293 4 AMX/RAMX.SXT,DT/WORD
:3294 3 AMX/RAMX.SXT,DT/BYTE
:3295 2 AMX/RAMX.OXT,DT/LONG
:3296 1 AMX/RAMX.OXT,DT/WORD
:3297 0 AMX/RAMX.OXT,DT/BYTE
:3298
:3299 --
:3300 *****
:3301 =0
:3302 AMX1: NEWTST
:3303 RC[OF]_K[.4]
:3304
:3305 =0 D 0,CALL,J/DCF ; SET UP THE CONSTANTS
:3306 NOP ; NEEDED TO COMPUTE EXPECTED
:3307 =0 CALL,J/DCF ; RESULTS.

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```

U 1232, 0000,003D,0180,0800,0000,1268
U 1233, 0018,0038,1180,09F8,0000,1234
U 1234, 0F00,003D,0180,0800,0000,101F
U 1235, 0000,003C,0180,0800,0000,1236
U 1236, 0000,003D,0180,0800,0000,101F

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ZZ-ESKAH-V132 TEST 58 AMX TEST
ESKAH21.MCR MICRO2 1M(01)

16-DEC-82 10:51:29

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U 1237, 0001,003C,0180,0AD8,0000,13A8 :3308      R[0B]_D           : R[0B]=000000FF
U 13A8, 0801,0028,0180,0AD0,0000,13A9 :3309      D_NOT.D,R[0A]_ALU : R[0A]=FFFFFFF0
U 13A9, 0100,003C,0180,0800,0000,1238 :3310      D_D.LEFT2,SI/ZERO
U 1238, 0100,003D,0180,0800,0000,1010 :3311      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 1239, 0001,003C,0180,0AC0,0000,13AA :3312      R[8]_D           : R[8]=0000FFFF
U 13AA, 0801,0028,0180,0AC8,0000,123A :3313      D_NOT.D,R[9]_ALU : R[9]=FFFF0000
U 123A, 0F00,003D,0180,0800,0000,1015 :3314      D_0,CALL,J/DC5   : SET UP A COUNTER USED
U 123B, 0001,003C,0180,0AAB,0000,123C :3315      R[5]_D           : TO INDEX TO THE FUNCTION.
                                     :3316      =0
U 123C, 0000,003D,0180,0800,0000,127E :3317      AMX2: SUBTEST
U 123D, 0818,0038,0580,0A98,0000,123E :3318      D_K[.1],R[3]_K[.1] : INITIALIZE THE TEST PATTERN.
U 123E, 0818,0039,0980,0800,0000,1010 :3319      D_K[.2],CALL,J/DC0 : INITIALIZE THE TEST PATTERN COUNTER.
U 123F, 0001,003C,0180,0AA0,0000,13AB :3320      R[4]_D           : R[4]=20
U 13AB, 0800,003C,0180,0A28,0000,1240 :3321      D_R[5]          : GO SET UP THE LOOP ON ERROR ADDRESS
                                     :3322      FOR THE FUNCTION NOW BEING TESTED.
U 1240, 0018,1939,1980,0AF8,0000,1070 :3323      =0 ALU_0(K),R[0F]_ALU,CALL,D3-0?,J/AMXLPR
U 1241, 0800,003C,0180,0A28,0000,1242 :3324      AMX4: D_R[5]          : GET THE FUNCTION INDICATOR
U 1242, 0000,193D,0180,0800,0000,1078 :3325      =0 CALL,D3-0?,J/AMXTAB : AND USE IT TO GET TO THE ROUTINE
                                     :3326      USED TO SIMULATE THE FUNCTION
                                     :3327      EXECUTE THE REAL FUNCTION
                                     :3328      AND CHECK THE RESULT.
U 1243, 0018,0000,0580,0AA0,0010,13AC :3329      R[4]_LA-K[.1],CLK.UBCC : DECREMENT THE PATTERN COUNTER.
U 13AC, 0000,013C,0180,0800,0000,1244 :3330      Z?
U 1244, 0800,003C,0180,0A18,0000,13AD :3331      =0 D_R[3],J/AMX5      : IF NON ZERO CONTINUE.
U 1245, 0F00,003C,0180,0800,0000,1246 :3332      D_0,J/AMX6      : OTHERWISE GO TO CHECK THE COMPLEMENT
                                     :3333      (0 IN 1'S) PATTERN.
U 13AD, 0500,003C,0180,0800,0000,13AE :3334      AMX5: D_D.LEFT,SI/ZERO
U 13AE, 0001,003C,0180,0A98,0000,1241 :3335      R[3]_D,J/AMX4
                                     :3336      =0
U 1246, 0818,0039,0980,0800,0000,1010 :3337      AMX6: D_K[.2],CALL,J/DC0      : SET UP A PATTERN COUNTER.
U 1247, 0001,003C,0180,0AA0,0000,13AF :3338      R[4]_D           : R[4]=20
U 13AF, 0F00,003C,0180,0800,0000,13B0 :3339      D_0
U 13B0, 0819,0000,0580,0800,0000,13B1 :3340      D_D-K[.1]        : SET UP THE TEST PATTERN
U 13B1, 0500,003C,0180,0800,0000,13B2 :3341      D_D.LEFT,SI/ZERO
U 13B2, 0001,003C,0180,0A98,0000,13B3 :3342      R[3]_D           : R[3]=FFFFFFFE
U 13B3, 0800,003C,0180,0A28,0000,1248 :3343      AMX7: D_R[5]          : GET THE FUNCTION INDICATOR
U 1248, 0000,193D,0180,0800,0000,1078 :3344      =0 CALL,D3-0?,J/AMXTAB : AND USE IT TO GO TO THE
                                     :3345      SUBROUTINE WHICH WILL
                                     :3346      FIRST SIMULATE THE FUNCTION
                                     :3347      THEN EXECUTE IT AND CHECK THE
                                     :3348      RESULT.
U 1249, 0018,0000,0580,0AA0,0010,13B4 :3349      R[4]_LA-K[.1],CLK.UBCC : DECREMENT THE COUNTER AND SEE
U 13B4, 0000,013C,0180,0800,0000,124A :3350      Z?
U 124A, 0800,003C,0180,0A18,0000,13B6 :3351      =0 D_R[3],J/AMX8      : IF IT IS ZERO.
U 124B, 0000,003C,0180,0A28,0010,13B5 :3352      A[U R[5],CLK.UBCC : IF NOT CONTINUE WITH THIS FUNCTION.
U 13B5, 0000,013C,0180,0800,0000,124C :3353      Z?,J/AMX9      : ELSE HAVE ALL FUNCTIONS BEEN TESTED?
U 13B6, 0018,0038,0180,0800,0000,13B7 :3354      AMX8: ALU_K[FFFF]
U 13B7, 0500,003C,0380,0800,0000,13B8 :3355      D_D.LEFT,SI/7
U 13B8, 0001,003C,0180,0A98,0000,13B3 :3356      R[3]_D,J/AMX7
                                     :3357      =0
U 124C, 0018,0000,0580,0AAB,0000,123C :3358      AMX9: R[5]_LA-K[.1],J/AMX2 : IF ALL FUNCTIONS NOT YET
                                     :3359      TESTED DECREMENT FUNCTION
                                     :3360      INDICATOR AND TEST NEXT
                                     :3361      FUNCTION.
U 124D, 0000,003C,0180,0800,0000,13ED :3362      J/AMX10          : DONE.

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```

:3363 :////////////////////
:3364 :+
:3365 : SUBTEST 1
:3366 : AMX_RAMX SXT[L]
:3367 : -
:3368 : =0
U 124E, 0000,003D,0180,0800,0000,1279 :3369 LPRA: ERLOOP
U 124F, 0800,003C,0180,0A78,0000,13B9 :3370 D_R[OF]
U 13B9, 0000,0D3C,0180,0800,0000,1005 :3371 SIGNS?
U 1005, 0018,003A,C180,0AF8,0000,0001 :3372 =101 R[OF]_K[.FFFF],RETURN1
:3373 :
:3374 :
:3375 : AMXA: D_R[3],Q_R[3]
:3376 : R[1]_D
:3377 :
:3378 : AMXA1: RAMX/D,AMX/RAMX.SXT,DT/LONG,ALU/A,Q_ALU
:3379 : R[2]_Q
:3380 : ALU_Q-D,CLK.UBCC : WAS THE RESULT CORRECT?
:3381 : Z?
:3382 : =0 J/AMXR : IF INCORRECT GO REPORT ERROR.
:3383 : LAB_R[4],RETURN1 : OTHERWISE RETURN, RESULT CORRECT.
:3384 :////////////////////
:3385 :+
:3386 : SUBTEST 2
:3387 : AMX_RAMX SXT[W]
:3388 : -
:3389 : =0
U 1252, 0000,003D,0180,0800,0000,1279 :3390 LPRB: ERLOOP
U 1253, 0800,003C,0180,0A78,0000,13BF :3391 D_R[OF]
U 13BF, 0000,0D3C,0180,0800,0000,100D :3392 SIGNS?
U 100D, 0018,003A,C180,0AF8,0000,0001 :3393 =101 R[OF]_K[.FFFF],RETURN1
U 100F, 0800,003C,01C0,0A18,0000,1254 :3394 D_R[3],Q_R[3]
:3395 :
:3396 :
:3397 : AMXB: D_D.SWAP,CALL,J/DCO : TEST D<15> TO COMPUTE THE EXPECTED
:3398 : D_D.LEFT2,SI/ZERO : SIGN EXTENDED RESULT.
:3399 : D_D.LEFT2,SI/ZERO
:3400 : D31?
:3401 : =110 LAB_R[9],ALU_LA[AND]Q,Q_ALU,J/AMXB1
:3402 : LAB_R[8],ALU_LA[OR]Q,Q_ALU
:3403 : AMXB1: R[1]_Q : SAVE EXPECTED RESULT.
:3404 : D_R[3] : SET UP OPERAND.
:3405 : : AND EXECUTE THE FUNCTION.
:3406 : RAMX/D,AMX/RAMX.SXT,DT/WORD,ALU/A,D_ALU
:3407 : R[2]_D : SAVE THE ACTUAL RESULT.
:3408 : ALU_Q-D,CLK.UBCC : RESULT CORRECT.
:3409 : Z?
:3410 : =0 J/AMXR : IF NOT THEN REPORT ERROR.
:3411 : LAB_R[4],RETURN1 : ELSE RETURN.
:3412 :////////////////////
:3413 :+
:3414 : SUBTEST 3
:3415 : AMX_RAMX SXT[B]
:3416 : -
:3417 : =0

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U 1258, 0000,003D,0180,0800,0000,1279 :3418
U 1259, 0800,003C,0180,0A78,0000,13C8 :3419
U 13C8, 0000,0D3C,0180,0800,0000,104D :3420
U 104D, 0018,003A,C180,0AF8,0000,0001 :3421
:3422
:3423
U 104F, 0800,003C,01C0,0A18,0000,13C9 :3424
U 13C9, 0800,003C,0180,0800,0000,13CA :3425
U 13CA, 0000,0D3C,0180,0800,0000,1056 :3426
U 1056, 001C,0034,01C0,0A58,0000,13CB :3427
U 1057, 001C,0030,01C0,0A50,0000,13CB :3428
U 13CB, 0001,203C,0180,0A88,0000,13CC :3429
U 13CC, 0800,003C,0180,0A18,0000,13CD :3430
:3431
U 13CD, 0802,803C,0180,0800,0000,13CE :3432
U 13CE, 0001,003C,0180,0A90,0000,13CF :3433
U 13CF, 001D,2000,0180,0800,0010,13D0 :3434
U 13D0, 0000,013C,0180,0800,0000,125A :3435
U 125A, 0000,003C,0180,0800,0000,13E4 :3436
U 125B, 0000,003E,0180,0A20,0000,0001 :3437
:3438
:3439
:3440
:3441
:3442
:3443
U 125C, 0000,003D,0180,0800,0000,1279 :3444
U 125D, 0800,003C,0180,0A78,0000,13D1 :3445
U 13D1, 0000,0D3C,0180,0800,0000,105D :3446
U 105D, 0018,003A,C180,0AF8,0000,0001 :3447
:3448
:3449
U 105F, 0800,003C,01C0,0A18,0000,13D2 :3450
U 13D2, 0000,003C,01F8,0800,0000,13D3 :3451
U 13D3, 0001,203C,0180,0A88,0000,13D4 :3452
:3453
U 13D4, 0003,003C,0180,0A90,0010,13D5 :3454
U 13D5, 0000,013C,0180,0800,0000,125E :3455
U 125E, 0000,003C,0180,0800,0000,13E4 :3456
U 125F, 0000,003E,0180,0A20,0000,0001 :3457
:3458
:3459
:3460
:3461
:3462
:3463
U 1260, 0000,003D,0180,0800,0000,1279 :3464
U 1261, 0800,003C,0180,0A78,0000,13D6 :3465
U 13D6, 0000,0D3C,0180,0800,0000,1065 :3466
U 1065, 0018,003A,C180,0AF8,0000,0001 :3467
:3468
:3469
:3470
U 1067, 0800,003C,01C0,0A18,0000,13D7 :3471
U 13D7, 001C,2034,01C0,0A48,0000,13D8 :3472

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LPRC:  ERLOOP
      D R[0F]
      SIGNS?
=101  R[0F]_K[.FFFF],RETURN1
      : WAS THIS A CALL TO SET
      : THE LOOP ON ERROR ADDRESS OR
      : DID AN ERROR ACTUALLY OCCUR
      : WITH THE LOOP ON ERROR
      : OPTION SELECTED BY THE USER.
      : SET UP THE OPERAND.
      : COMPUTE THE EXPECTED RESULT.

      D_R[3],Q_R[3]
AMXC:  D_D.SWAP
      D31?
=110  LAB_R[0B],ALU_LA[AND]Q,Q_ALU,J/AMXC1
      LAB_R[0A],ALU_LA[OR]Q,Q_ALU
AMXC1: R[1]_Q
      D_R[3]
      : SAVE THE EXPECTED RESULT.
      : SET UP THE OPERAND
      : AND EXECUTE THE FUNCTION.
      RAMX/D,AMX/RAMX.SXT,DT/BYTE,ALU/A,D_ALU
      R[2]_D
      : SAVE THE RESULT.
      ALU_Q-D,CLK.UBCC
      : WAS IT CORRECT?
      Z?
=0    J/AMXER
      LAB_R[4],RETURN1
      : IF INCORRECT REPORT ERROR.
      : OTHERWISE RETURN.
      :////////////////////////
      :+
      : SUBTEST      4
      : AMX_0, AMX_RAMX.OXT=0
      : -
      : =0
LPRD:  ERLOOP
      D R[0F]
      SIGNS?
=101  R[0F]_K[.FFFF],RETURN1
      : WAS THIS A CALL TO SET THE
      : LOOP ON ERROR ADDRESS OR DID
      : AN ERROR ACTUALLY OCCUR
      : WHILE THE USER HAD THE
      : LOOP ON ERROR OPTION SELECTED.
      : SET UP THE OPERAND.
      : EXPECTED RESULT IS 0.

      D_R[3],Q_R[3]
AMXD:  Q_0
      R[1]_Q
      : EXECUTE THE FUNCTION.
      RAMX/D,AMX/RAMX.OXT,DT/LONG,ALU/A,R[2]_ALU,CLK.UBCC
      Z?
      : AND TEST THE RESULT.
=0    J/AMXER
      LAB_R[4],RETURN1
      : IF INCORRECT REPORT ERROR.
      : OTHERWISE RETURN.
      :////////////////////////
      :+
      : SUBTEST      5
      : AMX_RAMX OXT[W]
      : -
      : =0
LPRE:  ERLOOP
      D R[0F]
      SIGNS?
=101  R[0F]_K[.FFFF],RETURN1
      : WAS THIS A CALL TO SET
      : THE LOOP ON ERROR ADDRESS
      : OR DID AN ERROR ACTUALLY
      : OCCUR WHILE THE USER HAD
      : THE LOOP ON ERROR OPTION
      : SELECTED.
      : SET UP THE OPERAND.
      : AND COMPUTE THE EXPECTED RESULT.

      D_R[3],Q_R[3]
AMXE:  LAB_R[9],ALU_LA[AND]D,Q_ALU

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U 13D8, 0001,203C,0180,0A88,0000,13D9 :3473
:3474
U 13D9, 0803,403C,0180,0800,0000,13DA :3475
U 13DA, 0001,003C,0180,0A90,0000,13DB :3476
U 13DB, 001D,2000,0180,0800,0010,13DC :3477
U 13DC, 0000,013C,0180,0800,0000,1262 :3478
U 1262, 0000,003C,0180,0800,0000,13E4 :3479
U 1263, 0000,003E,0180,0A20,0000,0001 :3480
:3481
:3482
:3483
:3484
:3485
:3486
U 1264, 0000,003D,0180,0800,0000,1279 :3487
U 1265, 0800,003C,0180,0A78,0000,13DD :3488
U 13DD, 0000,0D3C,0180,0800,0000,106D :3489
U 106D, 0018,003A,C180,0AF8,0000,0001 :3490
:3491
:3492
U 106F, 0800,003C,01C0,0A18,0000,13DE :3493
U 13DE, 001C,2034,01C0,0A58,0000,13DF :3494
U 13DF, 0001,203C,0180,0A88,0000,13E0 :3495
:3496
U 13E0, 0803,803C,0180,0800,0000,13E1 :3497
U 13E1, 0001,003C,0180,0A90,0000,13E2 :3498
U 13E2, 001D,2000,0180,0800,0010,13E3 :3499
U 13E3, 0000,013C,0180,0800,0000,1266 :3500
U 1266, 0000,003C,0180,0800,0000,13E4 :3501
U 1267, 0000,003E,0180,0A20,0000,0001 :3502
:3503
:3504
:3505
:3506
:3507
:3508
:3509
:3510
:3511
:3512
:3513
:3514
:3515
:3516
:3517
U 13E4, 0000,003C,0180,0A08,0000,13E5 :3518
U 13E5, 0000,003C,0180,09F0,0000,13E6 :3519
U 13E6, 0000,003C,0180,0A10,0000,13E7 :3520
U 13E7, 0000,003C,0180,09E8,0000,13E8 :3521
U 13E8, 0000,003C,0180,0A18,0000,13E9 :3522
U 13E9, 0000,003C,0180,09E0,0000,13EA :3523
U 13EA, 0000,003C,0180,0A28,0000,13EB :3524
U 13EB, 0000,003C,0180,09D8,0000,13EC :3525
U 13EC, 0000,003D,0180,0800,0000,127A :3526
:3527

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```

RC1]_Q ; SAVE THE EXPECTED RESULT.
; EXECUTE THE FUNCTION.
AMXE1: RAMX/D,AMX/RAMX.OXT,DT/WORD,ALU/A,D,ALU
RC2]_D ; SAVE THE ACTUAL RESULT.
ALU_Q-D,CLK.UBCC ; WAS IT CORRECT?
Z?
=0 J/AMXER ; IF INCORRECT REPORT THE ERROR.
LAB_R[4],RETURN1 ; OTHERWISE RETURN.
://////7////////////////////////////////////
:
: SUBTEST 6
: AMX_RAMX OXT[B]
:
=0
LPRF: ERLOOP
D R[0F] ; WAS THIS A CALL TO SET UP THE
SIGN? ; LOOP ON ERROR ADDRESS OR
=101 R[0F]_K[.FFFF],RETURN1 ; DID AN ERROR ACTUALLY OCCUR WHILE
; THE USER H/D THE LOOP ON ERROR
; OPTION SELECTED.
D R[3],Q R[3] ; SET UP THE OPERAND.
AMXF: LAB_R[0B],ALU_LA[AND]D,Q,ALU ; COMPUTE THE EXPECTED RESULT.
RC1]_Q ; AND SAVE IT.
; EXECUTE THE FUNCTION.
AMXF1: RAMX/D,AMX/RAMX.OXT,DT/BYTE,ALU/A,D,ALU
RC2]_D ; SAVE THE ACTUAL RESULT AND
ALU_Q-D,CLK.UBCC ; SEE IF IT WAS CORRECT.
Z?
=0 J/AMXER ; IF INCORRECT REPORT ERROR.
LAB_R[4],RETURN1 ; OTHERWISE RETURN.
: NOTE THAT WHEN AN ERROR OCCURS:
: RC[0E] = EXPECTED RESULT
: RC[0D] = GOT RESULT
: RC[0C] = OPERAND
: RC[0B] = OPERATION INVOLVED FOLLOWING THE
: CONVENTION
: 5 AMX/RAMX.SXT,DT/LONG
: 4 AMX/RAMX.SXT,DT/WORD
: 3 AMX/RAMX.SXT,DT/BYTE
: 2 AMX/RAMX.OXT,DT/LONG
: 1 AMX/RAMX.OXT,DT/WORD
: 0 AMX/RAMX.OXT,DT/BYTE
: THESE VALUES (OF RC[0E] THROUGH RC[0B]) WILL BE DISPLAYED
: WHEN AN ERROR OCCURS.
AMXER: LAB_R[1]
RC[0E]_LA
LAB_R[2]
RC[0D]_LA
LAB_R[3]
RC[0C]_LA
LAB_R[5]
RC[0B]_LA
ERROR1
: THIS TABLE IS USED TO INDEX TO THE APPROPRIATE

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ZZ-ESKAH-V132 TEST 58 AMX TEST
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:3528 ; ROUTINE TO SET UP THE LOOP ON ERROR ADDRESS FOR A PARTICULAR
:3529 ; FUNCTION.
:3530 =000
U 1070, 0000,003C,0180,0800,0000,1264 :3531 AMXLPR: J/LPRF
U 1071, 0000,003C,0180,0800,0000,1260 :3532 J/LPRE
U 1072, 0000,003C,0180,0800,0000,125C :3533 J/LPRD
U 1073, 0000,003C,0180,0800,0000,1258 :3534 J/LPRC
U 1074, 0000,003C,0180,0800,0000,1252 :3535 J/LPRB
U 1075, 0000,003C,0180,0800,0000,124E :3536 J/LPRA
:3537 =
:3538 ; THIS TABLE IS USED TO INDEX TO THE APPROPRIATE ROUTINE TO
:3539 ; EXECUTE THE PARTICULAR FUNCTION BEING TESTED AND CHECK THE RESULT.
:3540 =000
U 1078, 0800,003C,01C0,0A18,0000,13DE :3541 AMXTAB: D_R[3],Q_R[3],J/AMXF
U 1079, 0800,003C,01C0,0A18,0000,13D7 :3542 D_R[3],Q_R[3],J/AMXE
U 107A, 0800,003C,01C0,0A18,0000,13D2 :3543 D_R[3],Q_R[3],J/AMXD
U 107B, 0800,003C,01C0,0A18,0000,13C9 :3544 D_R[3],Q_R[3],J/AMXC
U 107C, 0800,003C,01C0,0A18,0000,1254 :3545 D_R[3],Q_R[3],J/AMXB
U 107D, 0800,003C,01C0,0A18,0000,13BA :3546 D_R[3],Q_R[3],J/AMXA
:3547 =
U 13ED, 0000,003C,0180,0800,0000,13EE :3548 APX10: NOP
U 13EE, 0000,003D,0180,0800,0000,1268 :3549 DUMMY4: NEWTST

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ESKAH21.MCR

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Location / Line Number Index

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF	Unused						
U 1000	1871=	1838	1845=	1861=	1839	3372=	1840	3375=
U 1008	1862=	1863=	1972=	1973=	1841	3393=	1842	3394=
U 1010	1951=	1952=	1953=	1954=	1955=	1956=	1957=	1958=
U 1018	1959=	1960=	1961=	1962=	1963=	1964=	1965=	1966=
U 1020	1995=	1996=	1997=	1998=	1999=	2000=	2001=	2002=
U 1028	2003=	2004=	2005=	2006=	2007=	2008=	2009=	2010=
U 1030	2013=	2014=	2015=	2016=	2017=	2018=	2019=	2020=
U 1038	2021=	2022=	2023=	2024=	2025=	2026=	2027=	2028=
U 1040	1983=	1984=	2032=	2033=	2035=	2036=	3401=	3402=
U 1048	2038=	2039=	2072=	2073=	1843	3421=	1900=	3424=
U 1050	2074=	2075=	2076=	2077=	2079=	2080=	3427=	3428=
U 1058	2081=	2082=	1903=	1844	1864	3447=	1906=	3450=
U 1060	2083=	2084=	2086=	2087=	1865	3467=	1866	3471=
U 1068	2093=	2094=	2097=	2098=	1867	3490=	1868	3493=
U 1070	3531=	3532=	3533=	3534=	3535=	3536=	2131=	2132=
U 1078	3541=	3542=	3543=	3544=	3545=	3546=	2133=	2134=
U 1080	2135=	2136=	2139=	2140=	2141=	2142=	2143=	2144=
U 1088	2146=	2147=	2154=	2155=	2158=	2159=	2199=	2200=
U 1090	2202=	2203=	2204=	2205=	2206=	2207=	2208=	2209=
U 1098	2210=	2211=	2212=	2213=	2214=	2215=	2216=	2217=
U 10AC	2218=	2220=	2222=	2223=	2224=	2225=	2227=	2228=
U 10A8	2229=	2230=	2231=	2232=	2233=	2234=	2235=	2236=
U 10B0	2237=	2238=	2239=	2240=	2241=	2242=	2243=	2244=
U 10B8	2246=	2247=	2253=	2254=	2294=	2295=	2296=	2297=
U 10C0	2299=	2300=	2301=	2302=	2303=	2304=	2305=	2306=
U 10C8	2307=	2308=	2309=	2310=	2311=	2312=	2313=	2314=
U 10D0	2315=	2317=	2319=	2320=	2321=	2322=	2323=	2324=
U 10D8	2326=	2327=	2328=	2329=	2330=	2331=	2332=	2333=
U 10E0	2334=	2335=	2336=	2337=	2338=	2339=	2340=	2341=
U 10E8	2342=	2343=	2345=	2346=	2352=	2353=	2389=	2390=
U 10F0	2391=	2392=	2393=	2394=	2396=	2397=	2399=	2400=
U 10F8	2406=	2407=	2408=	2409=	2411=	2412=	2414=	2415=
U 1100	1825=	1826=	1827=	1828=	1829=	1830=	1831=	1832=
U 1108	1833=	1869	2417=	2418=	1834=	1835=	1836=	1837=
U 1110	2424=	2425=	2427=	2428=	2434=	2435=	2437=	2438=
U 1118	2446=	2447=	2449=	2450=	2452=	2453=	2489=	2490=
U 1120	2492=	2493=	2494=	2495=	2497=	2498=	2500=	2501=
U 1128	2506=	2507=	2508=	2509=	2511=	2512=	2514=	2515=
U 1130	2517=	2518=	2524=	2525=	2527=	2528=	2534=	2535=
U 1138	2537=	2538=	2546=	2547=	2550=	2551=	2553=	2554=
U 1140	2578=	2579=	2591=	2592=	2595=	2597=	2598=	2599=
U 1148	2600=	2601=	2607=	2608=	2609=	2610=	2611=	2612=
U 1150	2618=	2619=	2621=	2622=	1870	1926=	2623=	2624=
U 1158	2630=	2631=	2634=	2635=	2638=	2639=	2640=	2641=
U 1160	2648=	2649=	2658=	2659=	2684=	2685=	2697=	2698=
U 1168	2699=	2700=	2701=	2702=	2705=	2706=	2707=	2708=
U 1170	2709=	2710=	2716=	2717=	2718=	2719=	2720=	2721=
U 1178	2727=	2728=	2729=	2730=	2731=	2732=	2733=	2734=
U 1180	2735=	2736=	2742=	2743=	2744=	2745=	2746=	2747=
U 1188	2749=	2750=	2753=	2754=	2755=	2757=	2763=	2764=
U 1190	2773=	2774=	2802=	2803=	2804=	2805=	2812=	2813=
U 1198	2814=	2815=	2820=	2821=	2827=	2828=	2829=	2830=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2836=	2837=	2843=	2844=	2845=	2846=	2852=	2853=
U 11A8	2859=	2860=	2861=	2862=	2869=	2870=	2876=	2877=
U 11B0	2878=	2879=	2885=	2886=	2892=	2893=	2894=	2895=
U 11B8	2901=	2902=	2908=	2909=	2910=	2911=	2918=	2919=
U 11C0	2925=	2926=	2927=	2928=	2935=	2936=	2942=	2943=
U 11C8	2944=	2945=	2947=	2948=	2952=	2953=	2959=	2960=
U 11D0	2961=	2962=	2971=	2972=	2978=	2979=	2980=	2981=
U 11D8	2991=	2992=	2998=	2999=	3000=	3001=	3011=	3012=
U 11E0	3037=	3038=	3039=	3040=	3046=	3047=	3048=	3049=
U 11E8	3055=	3056=	3062=	3063=	3064=	3065=	3070=	3071=
U 11F0	3077=	3078=	3079=	3080=	3085=	3086=	3092=	3093=
U 11F8	3094=	3095=	3100=	3101=	3107=	3108=	3109=	3110=
U 1200	3115=	3116=	3122=	3123=	3124=	3125=	3131=	3132=
U 1208	3138=	3139=	3140=	3141=	3149=	3150=	3156=	3157=
U 1210	3158=	3159=	3167=	3168=	3174=	3175=	3176=	3177=
U 1218	3183=	3184=	3190=	3191=	3192=	3193=	3199=	3200=
U 1220	3206=	3207=	3208=	3209=	3215=	3216=	3222=	3223=
U 1228	3224=	3225=	3233=	3234=	3240=	3241=	3242=	3243=
U 1230	3251=	3252=	3302=	3303=	3305=	3306=	3307=	3308=
U 1238	3311=	3312=	3314=	3315=	3317=	3318=	3319=	3320=
U 1240	3323=	3324=	3325=	3329=	3331=	3332=	3337=	3338=
U 1248	3344=	3349=	3351=	3352=	3358=	3362=	3369=	3370=
U 1250	3382=	3383=	3390=	3391=	3397=	3398=	3410=	3411=
U 1258	3418=	3419=	3436=	3437=	3444=	3445=	3456=	3457=
U 1260	3464=	3465=	3479=	3480=	3487=	3488=	3501=	3502=
U 1268	1880	1881	1882	1883	1884	1885	1886	1887
U 1270	1888	1889	1890	1891	1892	1893	1894	1895
U 1278	1896	1897	1898	1899	1901	1902	1934	1935
U 1280	1941	1942	1943	1946	1947	1948	1949	1967
U 1288	1968	1969	1974	1975	1976	1977	1978	1979
U 1290	1980	1985	1986	1987	1988	1989	1990	1991
U 1298	1992	2037	2085	2088	2089	2090	2091	2092
U 12A0	2095	2096	2137	2138	2145	2148	2149	2150
U 12A8	2151	2152	1927:	2153	2156	2157	2221	2245
U 12B0	2248	2249	2250	2251	2252	2318	2344	2347
U 12B8	2348	2349	2350	2351	2398	2401	2402	2403
U 12C0	2404	2405	2410	2416	2419	2420	2421	2422
U 12C8	2423	2426	2429	2430	2431	2432	2433	2436
U 12D0	2439	2440	2441	2442	2443	2444	2445	2448
U 12D8	2451	2491	2499	2502	2503	2504	2505	2510
U 12E0	2516	2519	2520	2521	2522	2523	2526	2529
U 12E8	2530	2531	2532	2533	2536	2539	2540	2541
U 12F0	2542	2543	2544	2545	2548	2549	2552	2593
U 12F8	2594	2620	2632	2633	2642	2643	2644	2645
U 1300	2646	2647	2650	2651	2652	2653	2654	2655
U 1308	2656	2657	2660	2703	2704	2748	2758	2759
U 1310	2760	2761	2762	2765	2766	2767	2768	2769
U 1318	2770	2771	2772	2775	2806	2816	2817	2818
U 1320	2819	2831	2832	2833	2834	2835	2847	2848
U 1328	2849	2850	2851	2863	2864	2865	2866	2867
U 1330	2868	2880	2881	2882	2883	2884	2896	2897
U 1338	2898	2899	2900	2912	2913	2915	2916	2917
U 1340	2929	2930	2932	2933	2934	2946	2949	2950

ZZ-ESKAH-V132
ESKAH21.MCR

Line Number Index

MICRO2

1M(01)

16-DEC-82 10:51:29

D 13

SEQ 0155
Page 9

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2951	2963	2964	2965	2966	2967	2968	2969
U 1350	2970	2982	2983	2984	2985	2986	2987	2988
U 1358	2989	2990	3002	3003	3004	3005	3006	3007
U 1360	3008	3009	3010	3050	3051	3052	3053	3054
U 1368	3066	3067	3068	3069	3081	3082	3083	3084
U 1370	3096	3097	3098	3099	3111	3112	3113	3114
U 1378	3126	3127	3128	3129	3130	3142	3143	3144
U 1380	3145	3146	3147	3148	3160	3161	3162	3163
U 1388	3164	3165	3166	3178	3179	3180	3181	3182
U 1390	3194	3195	3196	3197	3198	3210	3211	3212
U 1398	3213	3214	3226	3227	3228	3229	3230	3231
U 13A0	3232	3244	3245	3246	3247	3248	3249	3250
U 13A8	3309	3310	3313	3321	3330	3334	3335	3339
U 13B0	3340	3341	3342	3343	3350	3353	3354	3355
U 13B8	3356	3371	3376	3378	3379	3380	3381	3392
U 13C0	3399	3400	3403	3404	3406	3407	3408	3409
U 13C8	3420	3425	3426	3429	3430	3432	3433	3434
U 13D0	3435	3446	3451	3452	3454	3455	3466	3472
U 13D8	3473	3475	3476	3477	3478	3489	3494	3495
U 13E0	3497	3498	3499	3500	3518	3519	3520	3521
U 13E8	3522	3523	3524	3525	3526	3548	3549	
U 13F0	1910:	1911:	1912:	1913:	1914:	1915:	1916:	1917:
U 13F8	1918:	1919:	1920:	1921:	1922:	1923:	1924:	1925:

ZZ-ESKAH-V132 Line Number Index E 13
ESKAH21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

SEQ 0156
Page 9

	Words not in bounds
ESK00DEF	0
ESK00MAC	0
ESKAHMAC	0
ESKAH21	1023

Used	1023
Remaining	

Total microwords used in memory U: 1023
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

ZZ-ESKAH-V132 Line Number Index F 13
ESKAH21.MCR MICRO2 1M(01) 16-DEC-82 10:51:29

SEQ 0157
Page 9

; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH21.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

ZZ-ESKAH-V132 Table of Contents
ESKAH22.MCR MICRO2 1M(01) 16-DEC-82 10

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2139	TEST 59 ALU TEST
: 2782	TEST 5A PSL REGISTER DATA INTEGRITY
: 2876	TEST 5B ALU/A+B+PSL.C TEST
: 2942	TEST 5C SK ROM CHECKSUM TEST
: 3082	TEST 5D DFMX AND SHF MUX TEST

ZZ-ESKAH-V132 Subroutines
ESKAH22.MCR

MICRO2 1M(01) 16-DEC-82 10:55:45

:1
:1804 .NOLIST
:1805 .LIST


```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      .+
:1809      .FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      .WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      .R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      .THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      .THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      .FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1816      .6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      .ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      .R[OF] AND DO A RETURN.
:1819
:1820      .IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      .READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      .TO THE CONSOLE.
:1823
:1824      .-
:1825      1100:      SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
:1826      1101:      SC_K[.1],J/TRPH0      ; DATA UNALIGNED
:1827      1102:      SC_K[.2],J/TRPH0      ; X PAGE ERROR
:1828      1103:      SC_K[.3],J/TRPH0      ; TB MODIFY
:1829      1104:      SC_K[.4],J/TRPH0      ; TB PROT ERROR
:1830      1105:      SC_K[.6],J/TRPH0      ; TB MISS
:1831      1106:      SC_K[.9],J/TRPH0      ; RES FLOAT OPER
:1832      1107:      SC_K[.7],J/TRPH0      ; TB PARITY
:1833      1108:      SC_K[.8],J/TRPH0      ; CACHE PARITY
:1834      110C:      SC_K[.C],J/TRPH1      ; RDS
:1835      110D:      SC_K[.D],J/TRPH1      ; TIME OUT
:1836      110E:      SC_K[.10],J/TRPH0     ; ODD ADDRESS
:1837      110F:      SC_K[.F],J/TRPH1     ; CS PARITY
:1838      TRPH0:      Q_ID[USTACK]
:1839      .Q_D,D,Q
:1840      ID[USTACK],D
:1841      .Q_D,D,Q
:1842      Q-R[OF]
:1843      ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
:1844      Z?          ; BRANCH IF NO
:1845      =0          ALU_Q.AND.MASK,R[OF],ALU,RETURN ; CLEAR THE BIT AND RETURN
:1846      .+
:1847      .THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      .IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      .FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      .DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      .TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      .FAULT STATUS REGISTER
:1854      .SBI ERROR REGISTER
:1855      .TIMEOUT ADDRESS REGISTER
:1856      .MAINTENANCE REGISTER
:1857      .CACHE PARITY REGISTER
:1858      .TB ERROR REGISTER 1
:1859      .TB ERROR REGISTER 0
:1860      .-

```

```

U 1100. 0000.003C.1980.0800.0084.7003
U 1101. 0000.003C.0580.0800.0084.7001
U 1102. 0000.003C.0980.0800.0084.7001
U 1103. 0000.003C.0D80.0800.0084.7001
U 1104. 0000.003C.1180.0800.0084.7001
U 1105. 0000.003C.D580.0800.0084.7001
U 1106. 0000.003C.D980.0800.0084.7001
U 1107. 0000.003C.5D80.0800.0084.7001
U 1108. 0000.003C.0180.0800.0084.7001
U 110C. 0000.003C.8580.0800.0084.7003
U 110D. 0000.003C.8980.0800.0084.7003
U 110E. 0000.003C.6580.0800.0084.7001
U 110F. 0000.003C.6180.0800.0084.7003
U 1001. 0000.003C.81F0.2C00.0000.1004
U 1004. 0C00.003C.01E0.0800.0000.1006
U 1006. 0000.003C.8180.3C00.0000.1044
U 1044. 0C00.003C.01E0.0800.0000.1046
U 1046. 0000.003C.01C0.0A78.0000.104C
U 104C. 0001.2024.0180.0800.0010.1054
U 1054. 0000.013C.0180.0800.0000.1002
U 1002. 0001.2036.0180.0AF8.0000.0000

```

```

U 1003. 0018.0038.1D80.09E8.0000.1008 :1861
U 1008. 0000.003D.D980.0800.0084.71DC :1862
U 1009. 0000.003C.49F0.2C00.0000.1056 :1863
U 1056. 0001.203C.4DF0.2DB0.0000.105B :1864
U 105B. 0001.203C.65F0.2DB8.0000.105C :1865
U 105C. 0001.203C.6DF0.2DD8.0000.10D4 :1866
U 10D4. 0001.203C.75F0.2DE0.0000.10D6 :1867
U 10D6. 0001.203C.79F0.2DC8.0000.10E4 :1868
U 10E4. 0001.203C.69F0.2DC0.0000.10E6 :1869
U 10E6. 0001.203C.81F0.2DD0.0000.1000 :1870
U 1000. 0001.203D.0180.09F0.0000.11C4 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 10F4. 0000.003C.65F8.0800.0084.70F6 :1880
U 10F6. 0818.0038.8D80.0800.0000.1109 :1881
U 1109. 0D00.003C.0180.0800.0000.1114 :1882
U 1114. 0000.003C.3D80.3C00.0000.1116 :1883
U 1116. 0818.0038.0580.0800.0000.1124 :1884
U 1124. 0D00.003C.0180.0800.0000.1126 :1885
U 1126. 0F00.003C.3180.3C00.0000.1134 :1886
U 1134. 0000.003C.5D80.3C00.0000.1136 :1887
U 1136. 0000.003C.3980.3C00.0000.1154 :1888
U 1154. 0000.003C.2980.3C00.0000.115C :1889
U 115C. 0000.003C.4980.3C00.0000.115E :1890
U 115E. 0818.0038.C180.0800.0000.119C :1891
U 119C. 0000.003C.6580.3C00.0000.119E :1892
U 119E. 0F00.003C.6D80.3C00.0000.11AC :1893
U 11AC. 0000.003C.6D80.3C00.0000.11AE :1894
U 11AE. 0000.003C.6580.3C00.0000.11B4 :1895
U 11B4. 0003.003C.0180.09F0.0000.11B6 :1896
U 11B6. 0003.003C.0180.0AF8.0000.11BC :1897
U 11BC. 0003.003C.0180.09E8.0000.105E :1898
U 11BE. 0818.0038.0980.0800.0000.105E :1899
U 11C4. 0810.0038.0180.0978.0000.11C6 :1900
U 11C6. 0819.0034.4D80.0800.0000.104E :1901
U 104E. 0819.0030.1180.0800.0000.105E :1902
U 11CC. 0810.0038.0180.0978.0000.11CE :1903
U 11CE. 0819.0034.4D80.0800.0000.105A :1904
U 105A. 0819.0030.D580.0800.0000.105E :1905
:1906
:1907
U 105E. 0000.003C.1D80.3C00.0000.105E :1908
:1909
:1910
:1911
U 13F0. 0000.003C.0180.0800.0000.13F1 :1912
U 13F1. 0000.003C.0180.0800.0000.13F2 :1913
U 13F2. 0000.003C.0180.0800.0000.13F3 :1914
U 13F3. 0000.003C.0180.0800.0000.13F4 :1915

```

```

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

```

```

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

```

```

: NEWTST
: ERLOOP
: ERROR1
: ERROR2

```

```

SCOPE: SC_KC[10],Q_0

```

```

: SETUP TO WRITE IPL OF 1F
: ...
: WRITE THE PSL
: SETUP TO CLEAR THE CES REGISTER
: CLEAR THE CES REGISTER
: SHUT OFF THE FLOATING POINT
: CLEAR THE SIR REGISTER
: STOP INTERVAL TIMER
: SHUT OFF THE TB

```

```

D_KC[1F]
D-DAL.SC
ID[PSL]_D
D_KC[1]
D-DAL.SC
ID[CES]_D,D_0
ID[ACC.CS]_D
ID[SIR]_D
ID[CLK.CS]_D
ID[TBER0]_D
D_KC[FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0E] 0
RC[0F] 0
RC[0D] 0,J/CALLCON
D_KC[2],J/CALLCON
D_RC[0F]
D_D.AND.KC[FF00]
104E: D_D.OR.KC[4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.KC[FF00]
105A: D_D.OR.KC[6],J/CALLCON
105E:
CALLCON:

```

```

: CALL THE CONSOLE
: ERRLOOP CALL

```

```

ID[TXDB]_D,J/CALLCON

```

```

: CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```

```

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,11D4 :1929

```

```

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

```

```

:1930
:1931 :+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1932 : THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1933 : TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1934 : TYPING IT.
:1935

```

```

U 11D4, 0810,0038,4D80,0978,0000,11D6 :1936
U 11D6, 0019,4016,4D80,09F8,0000,0001 :1937

```

```

SUBTST: D RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1

```

```

:1938
:1939 :+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:1940 : LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:1941 : WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:1942

```

```

U 11DC, 0010,0038,01C0,0978,0000,11DE :1943
U 11DE, 0019,2034,4DC0,0800,0000,124D :1944
U 124D, 0019,2032,1D80,09F8,0000,0001 :1945

```

```

SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1

```

```

:1946
:1947 : THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

```

```

U 124E, 0118,0038,1B80,0800,0000,1252 :1948
U 124F, 0118,0038,0B80,0800,0000,1252 :1949
U 1250, 0118,0038,0780,0800,0000,1252 :1950
U 1251, 0118,0038,C380,0800,0000,1252 :1951

```

```

S00: ALU_0(K),D,D.LEFT2,S1/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,S1/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,S1/7,J/SX
=0000

```

```

U 1010, 0018,0038,1980,0800,0000,124E :1952
U 1011, 0018,0038,1980,0800,0000,124F :1953
U 1012, 0018,0038,1980,0800,0000,1250 :1954
U 1013, 0018,0038,1980,0800,0000,1251 :1955
U 1014, 0018,0038,0980,0800,0000,124E :1956
U 1015, 0018,0038,0980,0800,0000,124F :1957
U 1016, 0018,0038,0980,0800,0000,1250 :1958
U 1017, 0018,0038,0980,0800,0000,1251 :1959
U 1018, 0018,0038,0580,0800,0000,124E :1960
U 1019, 0018,0038,0580,0800,0000,124F :1961
U 101A, 0018,0038,0580,0800,0000,1250 :1962
U 101B, 0018,0038,0580,0800,0000,1251 :1963
U 101C, 0018,0038,C180,0800,0000,124E :1964
U 101D, 0018,0038,C180,0800,0000,124F :1965
U 101E, 0018,0038,C180,0800,0000,1250 :1966
U 101F, 0018,0038,C180,0800,0000,1251 :1967
U 1252, 0100,003E,0380,0800,0000,0001 :1968
U 1253, 0018,0038,01C0,0800,0000,100A :1969

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D,D.LEFT2,S1/7,RETURN1
DC.6: Q_K[.8]

```



```

=0
DC.6A: CALL,J/DC6
      ALU_Q-K[.1],Q_ALU,CLK.UBCC
      Z?
=0
      J/DC.6A
      RETURN1
DCAAAA: ALU_K[.1]
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      ALU_K[.1],D_D.LEFT2,SI/7
      D_D.LEFT2,SI/7,RETURN1
DRAAAA: ALU_K[.2]
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      ALU_K[.2],D_D.RIGHT2,SI/7
      D_D.RIGHT2,SI/7,RETURN1
DC.NF: D_0
      D_D-K[.1],J/DC0
; THIS TABLE IS USED AS A TARGET TO TEST BRANCHES.
; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
=0000
BRTBLE: Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
BRT1:  Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
BRT2:  Q-Q-K[.1]
      Q-Q-K[.1]
      Q-Q-K[.1]
      ALU_Q,CLK.UBCC
      Z?,ALU_Q+D,Q_ALU
=0
      RETURN1
      RETURN2
; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
=0
SHQLFT16: CALL,J/SHQLFT8
          J/SHQLFT8
SHQLFT8:  Q-Q.LEFT,SI/3
SHQLFT7:  Q-Q.LEFT,SI/3

```


U 126C, 0000,003C,01A8,0800,0000,126D :2026
 U 126D, 0000,003C,01A8,0800,0000,126E :2027
 U 126E, 0000,003C,01A8,0800,0000,126F :2028
 U 126F, 0000,003C,01A8,0800,0000,1270 :2029
 U 1270, 0000,003C,01A8,0800,0000,1271 :2030
 U 1271, 0000,003E,01A8,0800,0000,0001 :2031

Q-Q.LEFT,S1/3
 Q-Q.LEFT,S1/3
 Q-Q.LEFT,S1/3
 Q-Q.LEFT,S1/3
 Q-Q.LEFT,S1/3
 Q-Q.LEFT,S1/3,RETURN1

: THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.

U 1048, 0000,003D,0180,0800,0000,1272 :2032
 U 1049, 0000,003C,0180,0800,0000,1272 :2033
 U 1272, 0000,003C,03A8,0800,0000,1273 :2034
 U 1273, 0000,003C,03A8,0800,0000,1274 :2035
 U 1274, 0000,003C,03A8,0800,0000,1275 :2036
 U 1275, 0000,003C,03A8,0800,0000,1276 :2037
 U 1276, 0000,003C,03A8,0800,0000,1277 :2038
 U 1277, 0000,003C,03A8,0800,0000,1278 :2039
 U 1278, 0000,003C,03A8,0800,0000,1279 :2040
 U 1279, 0000,003E,03A8,0800,0000,0001 :2041

SHQL16: CALL,J/SHQL8
 J/SHQL8

SHQL8: Q-Q.LEFT,S1/7
 SHQ17: Q-Q.LEFT,S1/7

Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7
 Q-Q.LEFT,S1/7,RETURN1

: THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.

U 1030, 0001,203E,0180,0A80,0000,0001 :2042
 U 1031, 0001,203E,0180,0A88,0000,0001 :2043
 U 1032, 0001,203E,0180,0A90,0000,0001 :2044
 U 1033, 0001,203E,0180,0A98,0000,0001 :2045
 U 1034, 0001,203E,0180,0AA0,0000,0001 :2046
 U 1035, 0001,203E,0180,0AA8,0000,0001 :2047
 U 1036, 0001,203E,0180,0AB0,0000,0001 :2048
 U 1037, 0001,203E,0180,0AB8,0000,0001 :2049
 U 1038, 0001,203E,0180,0AC0,0000,0001 :2050
 U 1039, 0001,203E,0180,0AC8,0000,0001 :2051
 U 103A, 0001,203E,0180,0AD0,0000,0001 :2052
 U 103B, 0001,203E,0180,0AD8,0000,0001 :2053
 U 103C, 0001,203E,0180,0AE0,0000,0001 :2054
 U 103D, 0001,203E,0180,0AE8,0000,0001 :2055
 U 103E, 0001,203E,0180,0AF0,0000,0001 :2056
 U 103F, 0001,203E,0180,0AF8,0000,0001 :2057

WRRARB: R[0]-Q,RETURN1
 R[1]-Q,RETURN1
 R[2]-Q,RETURN1
 R[3]-Q,RETURN1
 R[4]-Q,RETURN1
 R[5]-Q,RETURN1
 R[6]-Q,RETURN1
 R[7]-Q,RETURN1
 R[8]-Q,RETURN1
 R[9]-Q,RETURN1
 R[0A]-Q,RETURN1
 R[0B]-Q,RETURN1
 R[0C]-Q,RETURN1
 R[0D]-Q,RETURN1
 R[0E]-Q,RETURN1
 R[0F]-Q,RETURN1

: THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.

U 1060, 0001,203E,0180,0980,0000,0001 :2058
 U 1061, 0001,203E,0180,0988,0000,0001 :2059
 U 1062, 0001,203E,0180,0990,0000,0001 :2060
 U 1063, 0001,203E,0180,0998,0000,0001 :2061
 U 1064, 0001,203E,0180,09A0,0000,0001 :2062
 U 1065, 0001,203E,0180,09A8,0000,0001 :2063
 U 1066, 0001,203E,0180,09B0,0000,0001 :2064
 U 1067, 0001,203E,0180,09B8,0000,0001 :2065
 U 1068, 0001,203E,0180,09C0,0000,0001 :2066
 U 1069, 0001,203E,0180,09C8,0000,0001 :2067
 U 106A, 0001,203E,0180,09D0,0000,0001 :2068
 U 106B, 0001,203E,0180,09D8,0000,0001 :2069
 U 106C, 0001,203E,0180,09E0,0000,0001 :2070
 U 106D, 0001,203E,0180,09E8,0000,0001 :2071
 U 106E, 0001,203E,0180,09F0,0000,0001 :2072
 U 106F, 0001,203E,0180,09F8,0000,0001 :2073

WRC: RC[0]-Q,RETURN1
 RC[1]-Q,RETURN1
 RC[2]-Q,RETURN1
 RC[3]-Q,RETURN1
 RC[4]-Q,RETURN1
 RC[5]-Q,RETURN1
 RC[6]-Q,RETURN1
 RC[7]-Q,RETURN1
 RC[8]-Q,RETURN1
 RC[9]-Q,RETURN1
 RC[0A]-Q,RETURN1
 RC[0B]-Q,RETURN1
 RC[0C]-Q,RETURN1
 RC[0D]-Q,RETURN1
 RC[0E]-Q,RETURN1
 RC[0F]-Q,RETURN1

: THESE ARE USED TO READ THE RA AND RB SCRATCH PADS

```

:2081
:2082
U 1070, 0000,003E,0180,0A00,0000,0001 :2083
U 1071, 0000,003E,0180,0A08,0000,0001 :2084
U 1072, 0000,003E,0180,0A10,0000,0001 :2085
U 1073, 0000,003E,0180,0A18,0000,0001 :2086
U 1074, 0000,003E,0180,0A20,0000,0001 :2087
U 1075, 0000,003E,0180,0A28,0000,0001 :2088
U 1076, 0000,003E,0180,0A30,0000,0001 :2089
U 1077, 0000,003E,0180,0A38,0000,0001 :2090
U 1078, 0000,003E,0180,0A40,0000,0001 :2091
U 1079, 0000,003E,0180,0A48,0000,0001 :2092
U 107A, 0000,003E,0180,0A50,0000,0001 :2093
U 107B, 0000,003E,0180,0A58,0000,0001 :2094
U 107C, 0000,003E,0180,0A60,0000,0001 :2095
U 107D, 0000,003E,0180,0A68,0000,0001 :2096
U 107E, 0000,003E,0180,0A70,0000,0001 :2097
U 107F, 0000,003E,0180,0A78,0000,0001 :2098
:2099
:2100
U 1080, 0000,003E,0180,0900,0000,0001 :2101
U 1081, 0000,003E,0180,0908,0000,0001 :2102
U 1082, 0000,003E,0180,0910,0000,0001 :2103
U 1083, 0000,003E,0180,0918,0000,0001 :2104
U 1084, 0000,003E,0180,0920,0000,0001 :2105
U 1085, 0000,003E,0180,0928,0000,0001 :2106
U 1086, 0000,003E,0180,0930,0000,0001 :2107
U 1087, 0000,003E,0180,0938,0000,0001 :2108
U 1088, 0000,003E,0180,0940,0000,0001 :2109
U 1089, 0000,003E,0180,0948,0000,0001 :2110
U 108A, 0000,003E,0180,0950,0000,0001 :2111
U 108B, 0000,003E,0180,0958,0000,0001 :2112
U 108C, 0000,003E,0180,0960,0000,0001 :2113
U 108D, 0000,003E,0180,0968,0000,0001 :2114
U 108E, 0000,003E,0180,0970,0000,0001 :2115
U 108F, 0000,003E,0180,0978,0000,0001 :2116
:2117
:2118
:2119
U 104A, 0F00,003D,0180,0800,0000,1267 :2120
U 104B, 0000,003C,0180,0800,0000,1050 :2121
:2122
U 1050, 0000,193D,0180,0800,0000,1030 :2123
U 1051, 0819,0014,0580,0800,0010,127A :2124
U 127A, 0000,013C,0180,0800,0000,1052 :2125
U 1052, 0000,003C,0180,0800,0000,1050 :2126
U 1053, 0000,003E,0180,0800,0000,0001 :2127
:2128
:2129
:2130
U 1058, 0F00,003D,0180,0800,0000,1267 :2131
U 1059, 0000,003C,0180,0800,0000,1090 :2132
:2133
U 1090, 0000,193D,0180,0800,0000,1060 :2134
U 1091, 0819,0014,0580,0800,0010,127B :2135

```

```

; INTO LA AND LB.
=0000
LTCHAB: LAB_R[0],RETURN1
        LAB_R[1],RETURN1
        LAB_R[2],RETURN1
        LAB_R[3],RETURN1
        LAB_R[4],RETURN1
        LAB_R[5],RETURN1
        LAB_R[6],RETURN1
        LAB_R[7],RETURN1
        LAB_R[8],RETURN1
        LAB_R[9],RETURN1
        LAB_R[0A],RETURN1
        LAB_R[0B],RETURN1
        LAB_R[0C],RETURN1
        LAB_R[0D],RETURN1
        LAB_R[0E],RETURN1
        LAB_R[0F],RETURN1
; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
=0000
LTCHRC: LC_RC[0],RETURN1
        LC_RC[1],RETURN1
        LC_RC[2],RETURN1
        LC_RC[3],RETURN1
        LC_RC[4],RETURN1
        LC_RC[5],RETURN1
        LC_RC[6],RETURN1
        LC_RC[7],RETURN1
        LC_RC[8],RETURN1
        LC_RC[9],RETURN1
        LC_RC[0A],RETURN1
        LC_RC[0B],RETURN1
        LC_RC[0C],RETURN1
        LC_RC[0D],RETURN1
        LC_RC[0E],RETURN1
        LC_RC[0F],RETURN1
; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
; CONTENTS OF Q.
=0
RARB.Q: D 0,CALL,J/DC.NF
        NOP
=0
RARB.QA: CALL,D3-0?,J/WRRARB
         D_D+K[.1],CLK.UBCC
         Z?
         J/RARB.QA
         RETURN1
; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
; CONTENTS OF Q.
=0
RC.Q:   D 0,CALL,J/DC.NF
        NOP
=0
RC.QA:  CALL,D3-0?,J/WRRC
         D_D+K[.1],CLK.UBCC

```

ZZ-ESKAH-V132 Subroutines
ESKAH22.MCR

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SEQ 0166
Page 5

U 127B.	0000.013C.0180.0800.0000.1094	:2136		Z?
U 1094.	0000.003C.0180.0800.0000.1090	:2137	=0	J/RC.QA
U 1095.	0000.003E.0180.0800.0000.0001	:2138		RETURN1

```

:2139 .PAGE "TEST 59 ALU TEST"
:2140 *****
:2141 ++
:2142 TEST 59 ALU TEST
:2143
:2144 TEST DESCRIPTION
:2145 THIS IS A TEST OF THE DATA PATH ALU. ALL
:2146 ALU FUNCTIONS ARE TEST EXCEPT A-B AND A+B (WHICH
:2147 ARE TESTED IN THE HARDWARE) AND THOSE FUNCTIONS
:2148 WHICH ARE ACCESSABLE ONLY THROUGH THE
:2149 SELECTION OF INSTRUCTION BUFFER DEPENDENT ALU
:2150 FUNCTION. TEST PATTERNS ARE GENERATED IN SUCH
:2151 A WAY AS TO GENERATE EVERY POSSIBLE COMBINATIONS
:2152 OF A<3:0> AND B<3:0> AND CIN FOR EACH 4 BIT SLICE
:2153 ALU CHIP.
:2154 SUBTEST 1 TESTS BEN ALU C31
:2155 SUBTEST 2 TESTS THE FUNCTION A
:2156 SUBTEST 3 TESTS THE FUNCTION B
:2157 SUBTEST 4 TESTS THE FUNCTION NOT.A
:2158 SUBTEST 5 TESTS THE FUNCTION A.OR.B
:2159 SUBTEST 6 TESTS THE FUNCTION A.AND.B
:2160 SUBTEST 7 TESTS THE FUNCTION A.ORNOR.B
:2161 SUBTEST 8 TESTS THE FUNCTION A.ANDNOT.B
:2162 SUBTEST 9 TESTS THE FUNCTION A.XOR.B
:2163 SUBTEST A TESTS THE FUNCTION A-B-1
:2164 SUBTEST B TESTS THE FUNCTION A+B+1
:2165 SUBTEST C TESTS THE FUNCTION A-B(RLOG)
:2166 SUBTEST D TESTS THE FUNCTION A+B(RLOG)
:2167
:2168 LOGIC DESCRIPTION
:2169 TESTED HERE ARE ALL THE ALU FUNCTIONS EXCEPT A-B
:2170 AND A+B (THESE HAVE BEEN TESTED IN THE HARDWARE
:2171 TESTS) AND THE FUNCTION ONLY ACCESSABLE THROUGH
:2172 USING AN INSTRUCTION DEPENDENT OPERATION. NOTE THAT
:2173 ONLY THE RESULT OF A.MINUS.B (RLOG) AND A.PLUS.B (RLOG)
:2174 ON THE ALU ARE CHECKED. THE RLOG STACK ITSELF IS TESTED
:2175 LATER.
:2176 IF A FAILURE OCCURS BECAUSE THE CONTROL LINES WHICH SELECT
:2177 THE ALU FUNCTION OR THE ALU CARRY IN TO ALU <00> ARE INCORRECT
:2178 THEN DAP IS AT FAULT. OTHERWISE THE BIT SLICE DATA PATH MODULE
:2179 WHICH IS INCORRECT IS AT FAULT. THE BIT SLICES ARE DIVIDED THUS:
:2180 BITS <07:00> ARE ON DCP
:2181 BITS <15:08> ARE ON DDP
:2182 BITS <31:16> ARE ON DEP
:2183 ANOTHER POSSIBILITY, ONLY WHEN EXECUTING AN ALU ADD OR SUB
:2184 IS THAT THE CARRY LOOK AHEAD LOGIC HAS FAILED. THIS LOGIC IS LOCATED
:2185 ON THE DCP MODULE.
:2186
:2187 ERROR DESCRIPTION
:2188 EXPECTED RESULT
:2189 GOT RESULT
:2190 A OPERAND
:2191 B OPERAND
:2192 ALU FUNCTION BEING TESTED AS GIVEN BY:
:2193 OC A+B **NOT BEING TESTED,BUT USED IN SUBTEST

```


:2194
:2195
:2196
:2197
:2198
:2199
:2200
:2201
:2202
:2203
:2204
:2205
:2206
:2207
:2208
:2209
:2210
:2211
:2212
:2213
:2214
:2215
:2216
:2217
:2218
:2219
:2220
:2221
:2222
:2223
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:2227
:2228
:2229
:2230
:2231
:2232
:2233
:2234
:2235
:2236
:2237
:2238
:2239
:2240
:2241
:2242
:2243
:2244
:2245
:2246
:2247
:2248

U 1098, 0000,003D,0180,0800,0000,10F4
U 1099, 0018,0038,D580,09F8,0000,109A

U 109A, 0000,003D,0180,0800,0000,11D4
U 109B, 0018,0038,8580,09D0,0000,127C
U 127C, 0F00,003C,3DF0,2C00,0000,127D
U 127D, 0001,203C,0180,0980,0000,127E
U 127E, 0819,2014,0580,0800,0000,127F
U 127F, 0001,003C,0180,0988,0000,109C

1 FOR BEN ALU C31 TEST**
0B A
0A B
09 NOT.A
08 A.OR.B
07 A.AND.B
06 A.ORNOT.B
05 A.ANDNOT.B
04 A.XOR.B
03 A-B-1
02 A+B+1
01 A-B (RLOG)
00 A+B (RLOG)
ERROR CODE AS GIVEN BY:
0 NO CARRY OUT OF ALU 31 WHEN ONE WAS EXPECTED
1 CARRY OUT OF ALU 31 WHEN ONE WAS *NOT* EXPECTED
2 NOT A CARRY OUT ERROR

THESE REGISTERS HAVE THE FOLLOWING SIGNIFICANCE DURING THIS
TEST:

R1=EXP RES
R2=GOT RES
R3=A PAT
R4=B PAT
R5=INCREMENT
R6=ACNT
R7=BCNT
R8=SHF CNT
R9=FUNCNT
RF=FLAG: ERROR=0
LOOPERR=0
ROA=TMP'S
ROB
ROC=TMP FLAG
ROD=TMPCNT
ROE=CONSTANT 32 (DEC)

=0
ALUTST: NEWTST
RC[0F]_K[.6]

////////////////////

+
SUBTEST 1
BEN ALU C31 TEST
**THIS SUBTEST IS COMPLETELY INDEPENDENT OF THE OTHER ROUTINES
(SIMULATIONS, CONSTANTS, ETC.) WITHIN THIS TEST.**

-
=0
ALUCDE: SUBTEST
RC[0A]_K[.C] : ERROR DATA FUNCTION
Q_ID[PSL]_D_0 : SAVE PSL WITH C-BIT CLEAR
RC[0]_Q
D_Q+K[.1] : SET THE C-BIT
RC[1]_D : SAVE PSL DATA WITH C-BIT SET

ZZ-ESKAH-V132 TEST 59 ALU TEST
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```

U 109C, 0000,003D,0180,0800,0000,11BE :2249
U 109D, 0810,0038,0180,0908,0000,1280 :2250
U 1280, 0000,003C,3D80,3C00,0000,1281 :2251
U 1281, 0018,0038,0580,09E0,0000,1282 :2252
U 1282, 0018,0038,0980,09F0,0000,1283 :2253
U 1283, 0F00,003C,05F8,0800,1404,7284 :2254
U 1284, 0818,0038,05C0,09D8,0000,1285 :2255
U 1285, 001D,0014,0180,09E8,0010,1286 :2256
U 1286, 0000,1B3C,0180,0800,0000,100E :2257
U 100E, 0000,003C,0180,0800,0000,1287 :2258
U 100F, 0018,0039,0580,09C8,0000,11C4 :2259
U 1287, 0810,0038,0180,0900,0000,1288 :2260
U 1288, 0003,003C,3D80,3DF0,0000,1289 :2261
U 1289, 0F00,003C,19F8,0800,1404,728A :2262
U 128A, 0018,0038,0180,0800,0000,128B :2263
U 128B, 0600,003C,0380,0800,0000,128C :2264
U 128C, 0001,003C,0180,09E0,0000,128D :2265
U 128D, 0001,203C,0180,09D8,0000,128E :2266
U 128E, 001D,0014,0180,09E8,0010,128F :2267
U 128F, 0000,1B3C,0180,0800,0000,109E :2268
U 109E, 0003,003D,0180,09C8,0000,11C4 :2269
U 109F, 0000,003C,0180,0800,0000,10AC :2270

:2271
:2272
:2273
:2274
U 10AC, 0F00,003D,0180,0800,0000,101B :2275
U 10AD, 0001,003C,0180,0AC8,0000,10BC :2276
:2277
:2278
U 10BC, 0000,003D,0180,0800,0000,11D4 :2279
U 10BD, 0F00,003C,0180,0800,0000,1290 :2280
U 1290, 0018,0038,0180,0800,0000,10C0 :2281
U 10C0, 0500,003D,0380,0800,0000,1010 :2282
U 10C1, 0001,003C,0180,0AA8,0000,1291 :2283
U 1291, 0500,003C,0180,0800,0000,1292 :2284
U 1292, 0001,003C,0180,0AF0,0000,1293 :2285
U 1293, 0800,003C,0180,0A48,0000,10C4 :2286
:2287
:2288
:2289
U 10C4, 0003,193D,0180,0AF8,0000,10A0 :2290
U 10C5, 0800,003C,0180,0A28,0000,1294 :2291
U 1294, 0001,003C,0180,0AB0,0000,1295 :2292
U 1295, 0003,003C,0180,0A98,0000,1296 :2293
U 1296, 0800,003C,0180,0A28,0000,1297 :2294
U 1297, 0001,003C,0180,0AB8,0000,1298 :2295
U 1298, 0003,003C,0180,0AA0,0000,1299 :2296
U 1299, 0800,003C,0180,0A48,0000,10C8 :2297
U 10C8, 0000,193D,0180,0800,0000,10B0 :2298
U 10C9, 0018,0000,0580,0AB8,0010,129A :2299
U 129A, 0000,013C,0180,0800,0000,10CA :2300
U 10CA, 0000,003C,0180,0A20,0000,129B :2301
U 10CB, 0000,003C,0180,0A30,0000,129C :2302
U 129B, 0018,0014,0580,0AA0,0000,1299 :2303

=0 ERLOOP ; THE PSL AND STATE ARE CONFIGURED
D RC[1] ; TO CATCH FAULTY SELECT LINES ON ICL
ID[PSL] D
RC[OC]_RC[1] ; SAVE A OPERAND
RC[OE]_RC[2] ; SAVE EXPECTED RESULT
STATE RC[1],Q_0,D_0
ALU_K[1],RC[OB]_ALU,D_ALU,Q_ALU ; SAVE B OPERAND
RC[OD]_ALU,ALU_D+Q,CLK_UBCC ; SAVE GOT RESULT
ALU.C? ; TEST INSTRUCTION
=1110 J/ALUCAS
ERROR1,RC[9]_K[1] ; ALU.C? FAILED (DEASSERTED)
ALUCAS: D RC[0] ; RESTORE PSL WITH C-BIT CLEAR
ID[PSL] D,RC[OE]_0 ; SAVE EXPECTED RESULT
STATE_K[ZERO],D_0,Q_0
ALU_K[FFFF]
D D.RIGHT,Q_Q.RIGHT,SI/7 ; SET OPERANDS TO GENERATE A CARRY
RC[OC]_D ; SAVE A OPERAND
RC[OB]_Q ; SAVE B OPERAND
RC[OD]_ALU,ALU_D+Q,CLK_UBCC ; SAVE EXPECTED RESULT
ALU.C? ; TEST INSTRUCTION
=1110 ERROR1,RC[9]_0 ; ALU.C? FAILED TO BE ASSERTED
NOP
:////////////////////
:
:
:
=0 D_0,CALL,J/DCB ; SET UP COUNTER WHICH INDICATES
RC[9]_D ; WHICH FUNCTION IS CURRENTLY
; BEING TESTED
=0
ALU1: SUBTEST
D_0 ; SET UP A CONSTANT=10
A[U_K[FFFF] ; IN R[5]
=0 D D.LEFT,SI/7,CALL,J/DC0
RC[5]_D
D D.[EFT,SI/3 ; SET UP CONSTANT (32 DEC.)
RC[OE]_D ; IN R[OE]
D_RC[9]
; GO SET UP THE LOOP ON
; ERROR ADDRESS FOR THIS
; FUNCTION.
=0 RC[OF]_0,CALL,D3-0?,J/LPTAB
ALU2: D RC[5] ; INITIALIZE THE A PATTERN COUNTER.
RC[6]_D
RC[3]_0 ; INITIALIZE THE A PATTERN.
ALU3: D RC[5] ; INITIALIZE THE B PATTERN COUNTER.
RC[7]_D
RC[4]_0 ; INITIALIZE THE B PATTERN.
ALU4: D RC[9] ; GO TO THE ROUTINE WHICH EXECUTES
=0 CALL,D3-0?,J/SIMXCT ; AND CHECKS THE FUNCTION BEING TESTED
RC[7]_LA-K[1],CLK_UBCC ; SEE IF B COUNT IS 1.
Z?
=0 LAB_RC[4],J/ALU6 ; IF NOT GO INCREMENT B PATTERN.
LAB_RC[6],J/ALU7 ; OTHERWISE GO CHECK A COUNT.
ALU6: RC[4]_LA+K[1],J/ALU4 ; INCREMENT B PATTERN AND CONTINUE

```

```

:2304
U 129C, 0018,0000,0580,0AB0,0010,129D :2305
U 129D, 0000,013C,0180,0800,0000,10CC :2306
U 10CC, 0000,003C,0180,0A18,0000,129E :2307
U 10CD, 0000,003C,0180,0A70,0000,10D0 :2308
U 129E, 0018,0014,0580,0A98,0000,1296 :2309
:2310
:2311
:2312
:2313
:2314
:2315
U 10D0, 0F00,003D,0180,0800,0000,1018 :2316
U 10D1, 0001,003C,0180,0AA8,0000,10D2 :2317
U 10D2, 0F00,003D,0180,0800,0000,1017 :2318
U 10D3, 0001,003C,0180,0AC0,0000,129F :2319
U 129F, 0800,003C,0180,0A70,0000,12A0 :2320
U 12A0, 0001,003C,0180,0AB0,0000,12A1 :2321
U 12A1, 0003,003C,0180,0A98,0000,12A2 :2322
U 12A2, 0800,003C,0180,0A70,0000,12A3 :2323
U 12A3, 0001,003C,0180,0AB8,0000,12A4 :2324
U 12A4, 0003,003C,0180,0AA0,0000,12A5 :2325
U 12A5, 0800,003C,0180,0A48,0000,10D8 :2326
U 10D8, 0000,193D,0180,0800,0000,10B0 :2327
:2328
U 10D9, 0018,0000,0580,0AB8,0010,12A6 :2329
U 12A6, 0000,013C,0180,0800,0000,10DA :2330
U 10DA, 0800,003C,0180,0A20,0000,12A7 :2331
U 10DB, 0000,003C,0180,0A30,0000,12A9 :2332
U 12A7, 0000,003C,0180,0A28,0000,12A8 :2333
U 12A8, 001C,2014,0180,0AA0,0000,12A5 :2334
U 12A9, 0018,0000,0580,0AB0,0010,12AB :2335
U 12AB, 0000,013C,0180,0800,0000,10DC :2336
U 10DC, 0800,003C,0180,0A18,0000,12AC :2337
U 10DD, 0000,003C,0180,0A40,0000,12AE :2338
:2339
U 12AC, 0000,003C,0180,0A28,0000,12AD :2340
U 12AD, 001C,2014,0180,0A98,0000,12A2 :2341
U 12AE, 0018,0000,0580,0AC0,0010,12AF :2342
U 12AF, 0000,013C,0180,0800,0000,10E0 :2343
U 10E0, 0800,003C,0180,0A28,0000,10E2 :2344
U 10E1, 0000,003C,0180,0A48,0010,12B0 :2345
U 12B0, 0000,013C,0180,0800,0000,10E8 :2346
:2347
U 10E2, 0000,003D,0180,0800,0000,1010 :2348
U 10E3, 0001,003C,0180,0AA8,0000,129F :2349
:2350
U 10E8, 0018,0000,0580,0AC8,0000,10BC :2351
:2352
U 10E9, 0000,003C,0180,0800,0000,133E :2353
:2354
:2355
:2356
U 10A0, 0000,003C,0180,0800,0000,11AA :2357
U 10A1, 0000,003C,0180,0800,0000,115A :2358

ALU7: R[6]_LA-K[.1],CLK.UBCC : TEST.
Z? : SEE IF A COUNT IS 1.
=0 LAB R[3],J/ALU9 : IF NOT THEN GO INCREMENT A PATTERN.
LAB R[0E],J/ALU10 : OTHERWISE GO CHECK NEXT FOUR BIT SLICE.
ALU9: R[3]_LA+K[.1],J/ALU3 : INCREMENT A PATTERN, GO INITIALIZE
: B PATTERN AND B COUNT AND
: CONTINUE THE TEST.
=0
: NOW SET UP FOR TESTING HIGH ORDER FOUR BIT SLICE
: ALU CHIPS.
ALU10: D 0,CALL,J/DC8 : SET UP PATTERN INCREMENT.
R[5] D : R[5]=8
=0 D 0,CALL,J/DC7 : SET UP COUNTER FOR NUMBER
R[8] D : OF BIT SLICES TO BE TESTED, 7.
ALU12: D R[0E] : SET UP A PATTERN COUNTER.
R[6] D : R[6]=32 (DEC.)
R[3] 0 : SET UP A PATTERN.
ALU13: D R[0E] : SET UP B PATTERN COUNTER.
R[7] D : R[7]= 32(DEC.)
R[4] 0 : SET UP B PATTERN
ALU14: D R[9] : GO TO THE ROUTINE THAT
=0 CALL,D3-0?,J/SIMXCT : SIMULATES EXECUTES AND CHECKS
: THE FUNCTION BEING TESTED.
: IS THE B COUNT 1?
R[7]_LA-K[.1],CLK.UBCC
Z?
=0 D R[4],J/ALU16 : IF NOT GO INCREMENT THE B PATTERN.
LAB R[6],J/ALU17 : OTHERWISE LOOK AT A COUNT.
ALU16: LAB R[5] : INCREMENT B PATTERN BY R[5]
R[4]_LA+D,J/ALU14 : AND CONTINUE TEST.
ALU17: R[6]_LA-K[.1],CLK.UBCC : IS A COUNTER 1?
Z?
=0 D R[3],J/ALU19 : IF NOT INCREMENT A PATTERN.
LAB R[8],J/ALU20 : OTHERWISE SEE IF ALL
: BIT SLICES HAVE BEEN TESTED.
ALU19: LAB R[5] : INCREMENT A PATTERN BY R[5]
R[3]_LA+D,J/ALU13 : AND CONTINUE TEST.
ALU20: R[8]_LA-K[.1],CLK.UBCC : SEE IF ALL 4-BIT SLICES HAVE
Z? : BEEN TESTED.
=0 D R[5],J/ALU22 : IF NOT GO TO NEXT SLICE.
A[U R[9],CLK.UBCC : OTHERWISE SEE IF ALL FUNCTIONS
Z?,J/ALU23 : HAVE BEEN TESTED.
=0
ALU22: CALL,J/DC0 : IF ALL 4-BIT SLICES HAVEN'T BEEN
R[5]_D,J/ALU12 : TESTED MOVE TO NEXT SLICE.
=0
ALU23: R[9]_LA-K[.1],J/ALU1 : ALL FUNCTIONS HAVEN'T BEEN
: TESTED SO DECREMENT COUNTER
: AND RESTART TEST.
ALU24: J/ALU100 : DONE!
: THIS TABLE IS USED TO INDEX TO THE ROUTINES WHICH SET UP
: THE LOOP ON ERROR ADDRESSES FOR EACH FUNCTION:
=0000
LPTAB: J/LPERF12
J/LPERF11

```


U 10A2, 0000,003C,0180,0800,0000,1150 :2359
U 10A3, 0000,003C,0180,0800,0000,1130 :2360
U 10A4, 0000,003C,0180,0800,0000,112A :2361
U 10A5, 0000,003C,0180,0800,0000,1122 :2362
U 10A6, 0000,003C,0180,0800,0000,111C :2363
U 10A7, 0000,003C,0180,0800,0000,1112 :2364
U 10A8, 0000,003C,0180,0800,0000,10FC :2365
U 10A9, 0000,003C,0180,0800,0000,10F8 :2366
U 10AA, 0000,003C,0180,0800,0000,10F0 :2367
U 10AB, 0000,003C,0180,0800,0000,10EA :2368

J/LPERF10
J/LPERF9
J/LPERF8
J/LPERF7
J/LPERF6
J/LPERF5
J/LPERF4
J/LPERF3
J/LPERF2
J/LPERF1

=
: THIS TABLE IS USED TO INDEX TO THE ROUTINES USED TO
: SIMULATE THE FUNCTION, THEN EXECUTE IT AND CHECK THE RESULT:

U 10B0, 0800,003C,0180,0A18,0000,1328 :2373
U 10B1, 0800,003C,0180,0A18,0000,131C :2374
U 10B2, 0800,003C,0180,0A18,0000,1310 :2375
U 10B3, 0800,003C,0180,0A18,0000,1304 :2376
U 10B4, 0800,003C,0180,0A18,0000,12F5 :2377
U 10B5, 0800,003C,0180,0A18,0000,12EC :2378
U 10B6, 0800,003C,0180,0A18,0000,12E3 :2379
U 10B7, 0800,003C,0180,0A70,0000,12D6 :2380
U 10B8, 0800,003C,0180,0A70,0000,12C9 :2381
U 10B9, 0800,003C,0180,0A18,0000,12C0 :2382
U 10BA, 0800,003C,0180,0A18,0000,12B9 :2383
U 10BB, 0800,003C,0180,0A18,0000,12B2 :2384

=0000
SIMXCT: D_R[3],J/SIM12
D_R[3],J/SIM11
D_R[3],J/SIM10
D_R[3],J/SIM9
D_R[3],J/SIM8
D_R[3],J/SIM7
D_R[3],J/SIM6
D_R[OE],J/SIM5
D_R[OE],J/SIM4
D_R[3],J/SIM3
D_R[3],J/SIM2
D_R[3],J/SIM1

=
: //////////////////////////////////////

: +
: SUBTEST 2
: ROUTINE TO SIMULATE, EXECUTE AND CHECK THE ALU/A FUNCTION.

U 10EA, 0000,003D,0180,0800,0000,11BE :2392
U 10EB, 0800,003C,0180,0A78,0000,12B1 :2393
U 12B1, 0000,0D3C,0180,0800,0000,1005 :2394
U 1005, 0018,003A,C180,0AF8,0000,0001 :2395

=0
LPERF1: ERLOOP
D_R[OF] : WAS THIS CALL TO SET THE
SIGNS? : THE LOOP ON ERROR ADDRESS
=101 R[OF]_K[.FFFF],RETURN1 : OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS AND
: SAVE THE EXPECTED RESULT.

U 1007, 0800,003C,0180,0A18,0000,12B2 :2398
U 12B2, 0000,003C,01C0,0A20,0000,12B3 :2399
U 12B3, 0001,003C,0180,0A88,0000,12B4 :2400
U 12B4, 001D,003C,01C0,0A90,0000,12B5 :2401
U 12B5, 0800,003C,0180,0A08,0000,12B6 :2402
U 12B6, 001D,2000,0180,0800,0010,12B7 :2403
U 12B7, 0000,013C,0180,0800,0000,10EC :2404
U 10EC, 0000,003C,0180,0800,0000,11C2 :2405
U 10ED, 0000,003E,0180,0A38,0000,0001 :2406

SIM1: D_R[3]
Q_R[4]
R[1] D
XCT1: ALU D[A]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION
D_R[1]
XCT1B: A[U_Q-D,CLK.UBCC] ; CHECK THE RESULT.
Z?
=0 J/ALUER2 ; RESULT INCORRECT.
LAB_R[7],RETURN1

: //////////////////////////////////////

: +
: SUBTEST 3
: SIMULATE EXECUTE AND CHECK THE ALU/B FUNCTION

U 10F0, 0000,003D,0180,0800,0000,11BE :2413

=0
LPERF2: ERLOOP


```

U 10F1, 0800,003C,0180,0A78,0000,12B8 :2414
U 12B8, 0000,0D3C,0180,0800,0000,1045 :2415
U 1045, 0018,003A,C180,0AF8,0000,0001 :2416
:2417
:2418
U 1047, 0800,003C,0180,0A18,0000,12B9 :2419
U 12B9, 0000,003C,01C0,0A20,0000,12BA :2420
U 12BA, 0001,203C,0180,0A88,0000,12BB :2421
U 12BB, 001D,0038,01C0,0A90,0000,12BC :2422
U 12BC, 0800,003C,0180,0A08,0000,12BD :2423
U 12BD, 001D,2000,0180,0800,0010,12BE :2424
U 12BE, 0000,013C,0180,0800,0000,10F2 :2425
U 10F2, 0000,003C,0180,0800,0000,11C2 :2426
U 10F3, 0000,003E,0180,0A38,0000,0001 :2427
:2428
:2429
:2430
:2431
:2432
:2433
U 10F8, 0000,003D,0180,0800,0000,11BE :2434
U 10F9, 0800,003C,0180,0A78,0000,12BF :2435
U 12BF, 0000,0D3C,0180,0800,0000,104D :2436
U 104D, 0018,003A,C180,0AF8,0000,0001 :2437
:2438
:2439
U 104F, 0800,003C,0180,0A18,0000,12C0 :2440
U 12C0, 0000,003C,01F8,0800,0000,12C1 :2441
U 12C1, 0019,2000,05C0,0800,0000,12C2 :2442
U 12C2, 001D,2000,0180,0A88,0000,12C3 :2443
U 12C3, 0000,003C,01C0,0A20,0000,12C4 :2444
U 12C4, 001D,0028,01C0,0A90,0000,12C5 :2445
U 12C5, 0800,003C,0180,0A08,0000,12C6 :2446
U 12C6, 001D,2000,0180,0800,0010,12C7 :2447
U 12C7, 0000,013C,0180,0800,0000,10FA :2448
U 10FA, 0000,003C,0180,0800,0000,11C2 :2449
U 10FB, 0000,003E,0180,0A38,0000,0001 :2450
:2451
:2452
:2453
:2454
:2455
:2456
U 10FC, 0000,003D,0180,0800,0000,11BE :2457
U 10FD, 0800,003C,0180,0A78,0000,12C8 :2458
U 12C8, 0000,0D3C,0180,0800,0000,1055 :2459
U 1055, 0018,003A,C180,0AF8,0000,0001 :2460
:2461
:2462
U 1057, 0800,003C,0180,0A70,0000,12C9 :2463
U 12C9, 0001,003C,0180,0AE8,0000,12CA :2464
U 12CA, 0800,003C,0180,0A18,0000,12CB :2465
U 12CB, 0000,003C,01C0,0A20,0000,12CC :2466
U 12CC, 0000,0D3C,0180,0800,0000,1092 :2467
:2468

```

```

D_R[0F] : WAS THIS CALL TO SET THE
SIGNS? : THE LOOP ON ERROR ADDRESS
=101 R[0F]_K[.FFFF],RETURN1 : OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS
: AND SAVE THE EXPECTED RESULT.

SIM2: D_R[3]
Q-R[4]
R[1] Q
XCT2: ALU D[B]Q,Q_ALU,R[2]_ALU : TEST INSTRUCTION
D_R[1]
XCT2B: ACU_Q-D,CLK.UBCC : WAS THE RESULT CORRECT?
Z?
=0 J/ALUER2 : RESULT INCORRECT REPORT ERROR.
LAB R[7],RETURN1
:////////////////////
:
: SUBTEST 4
: SIMULATE , EXECUTE AND CHECK THE RESULT OF THE ALU/NOTA FUNCTION
:
:=-
:0
LPERF3: ERLOOP
D_R[0F] : WAS THIS CALL TO SET THE
SIGNS? : THE LOOP ON ERROR ADDRESS
=101 R[0F]_K[.FFFF],RETURN1 : OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS.
: CALCULATE THE EXPECTED
: RESULT.
: NOT.A=-1-A

SIM3: D_R[3]
Q-Q
Q-Q-K[.1]
ACU_Q-D,R[1]_Q-D : NOT.A=-1-A
XCT3: Q-R[4]
ACU D[NOTA]Q,Q_ALU,R[2]_ALU : TEST INSTRUCTION.
D_R[1]
XCT3B: ACU_Q-D,CLK.UBCC : RESULT CORRECT?
Z?
=0 J/ALUER2 : RESULT INCORRECT.
LAB R[7],RETURN1
:////////////////////
:
: SUBTEST 5
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/OR FUNCTION
:
:=-
:0
LPERF4: ERLOOP
D_R[0F] : WAS THIS CALL TO SET THE
SIGNS? : THE LOOP ON ERROR ADDRESS
=101 R[0F]_K[.FFFF],RETURN1 : OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS.
: AND CALCULATE THE
: EXPECTED RESULT.

SIM4: D_R[0E]
R[0D] Q
D_R[3]
Q-R[4]
SIGNS?
=010

```

```

U 1092, 0500,003C,01A8,0A68,0000,12CD :2469
U 1093, 0500,003C,03A8,0A68,0000,12CD :2470
U 1096, 0500,003C,03A8,0A68,0000,12CD :2471
U 1097, 0500,003C,03A8,0A68,0000,12CD :2472
U 12CD, 0018,0000,0580,0AE8,0010,12CE :2473
U 12CE, 0000,013C,0180,0800,0000,110A :2474
U 110A, 0000,0D3C,0180,0800,0000,1092 :2475
U 110B, 0001,203C,0180,0A88,0000,12CF :2476
U 12CF, 0800,003C,0180,0A18,0000,12D0 :2477
U 12D0, 0000,003C,01C0,0A20,0000,12D1 :2478
U 12D1, 001D,0030,01C0,0A90,0000,12D2 :2479
U 12D2, 0800,003C,0180,0A08,0000,12D3 :2480
U 12D3, 001D,2000,0180,0800,0010,12D4 :2481
U 12D4, 0000,013C,0180,0800,0000,1110 :2482
U 1110, 0000,003C,0180,0800,0000,11C2 :2483
U 1111, 0000,003E,0180,0A38,0000,0001 :2484

```

```

SIM4A: Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM4B
        Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
        Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
        Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
SIM4B: R[0D],LA-K[.1],CLK.UBCC
        Z?
=0      SIGNS?,J/SIM4A
        R[1] Q ; SAVE THE EXPECTED RESULT.
XCT4:   D_R[3] ; SET UP THE OPERANDS.
        Q_R[4]
        ALU_D[OR]Q,Q_ALU,R[2],ALU ; TEST INSTRUCTION
        D_R[1]
XCT4B:  ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
        Z?
=0      J/ALUER2 ; RESULT INCORRECT.
        LAB_R[7],RETURN1

```

```

://////7////////////////////////////////////
:
: SUBTEST 6
: SIMUALTE EXECUTE AND CHECK THE RESULT OF THE ALU/AND FUNCTION
:-

```

```

=0
LPERF5: ERLOOP
        D_R[0F]
        SIGNS? ; WAS THIS CALL TO SET THE
                ; THE LOOP ON ERROR ADDRESS
=101    R[0F],K[.FFFF],RETURN1 ; OR DID AN ERROR ACTUALLY OCCUR
                ; WITH THE LOOP ON ERROR OPTION
                ; SPECIFIED BY THE USER.
                ; SET UP THE OPERANDS.
SIM5:   D_R[0E]
        R[0D] D ; AND GET READY TO
        D_R[3] ; CALCULATE THE EXPECTED
        Q_R[4] ; RESULT.
        SIGNS?

```

```

=010
SIM5A:  Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
        Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
        Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
        Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM5B
SIM5B:  R[0D],LA-K[.1],CLK.UBCC
        Z?
=0      SIGNS?,J/SIM5A
        R[1] Q ; SAVE THE EXPECTED RESULT.
XCT5:   D_R[3] ; SET UP THE OPERANDS.
        Q_R[4]
        ALU_D[AND]Q,Q_ALU,R[2],ALU ; TEST INSTRUCTION.
        D_R[1]
XCT5B:  ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
        Z?
=0      J/ALUER2 ; RESULT INCORRECT.
        LAB_R[7],RETURN1

```

```

://////7////////////////////////////////////
:
: SUBTEST 7
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/ORNOT FUNCTION.
:-

```

```

:2485
:2486
:2487
:2488
:2489
:2490
U 1112, 0000,003D,0180,0800,0000,11BE :2491
U 1113, 0800,003C,0180,0A78,0000,12D5 :2492
U 12D5, 0000,0D3C,0180,0800,0000,105D :2493
U 105D, 0018,003A,C180,0AF8,0000,0001 :2494
:2495
:2496
U 105F, 0800,003C,0180,0A70,0000,12D6 :2497
U 12D6, 0001,003C,0180,0AE8,0000,12D7 :2498
U 12D7, 0800,003C,0180,0A18,0000,12D8 :2499
U 12D8, 0000,003C,01C0,0A20,0000,12D9 :2500
U 12D9, 0000,0D3C,0180,0800,0000,10C2 :2501
:2502
U 10C2, 0500,003C,01A8,0A68,0000,12DA :2503
U 10C3, 0500,003C,01A8,0A68,0000,12DA :2504
U 10C6, 0500,003C,01A8,0A68,0000,12DA :2505
U 10C7, 0500,003C,03A8,0A68,0000,12DA :2506
U 12DA, 0018,0000,0580,0AE8,0010,12DB :2507
U 12DB, 0000,013C,0180,0800,0000,1118 :2508
U 1118, 0000,0D3C,0180,0800,0000,10C2 :2509
U 1119, 0001,203C,0180,0A88,0000,12DC :2510
U 12DC, 0800,003C,0180,0A18,0000,12DD :2511
U 12DD, 0000,003C,01C0,0A20,0000,12DE :2512
U 12DE, 001D,0034,01C0,0A90,0000,12DF :2513
U 12DF, 0800,003C,0180,0A08,0000,12E0 :2514
U 12E0, 001D,2000,0180,0800,0010,12E1 :2515
U 12E1, 0000,013C,0180,0800,0000,111A :2516
U 111A, 0000,003C,0180,0800,0000,11C2 :2517
U 111B, 0000,003E,0180,0A38,0000,0001 :2518
:2519
:2520
:2521
:2522
:2523

```

```

:2524
U 111C, 0000,003D,0180,0800,0000,11BE :2525
U 111D, 0800,003C,0180,0A78,0000,12E2 :2526
U 12E2, 0000,0D3C,0180,0800,0000,10D5 :2527
U 10D5, 0018,003A,C180,0AF8,0000,0001 :2528
:2529
:2530
U 10D7, 0800,003C,0180,0A18,0000,12E3 :2531
U 12E3, 0000,003C,01C0,0A20,0000,12E4 :2532
U 12E4, 0001,2028,01C0,0800,0000,12E5 :2533
U 12E5, 001D,0030,0180,0A88,0000,12E6 :2534
:2535
U 12E6, 0000,003C,01C0,0A20,0000,12E7 :2536
U 12E7, 001D,001C,01C0,0A90,0000,12E8 :2537
U 12E8, 0800,003C,0180,0A08,0000,12E9 :2538
U 12E9, 001D,2000,0180,0800,0010,12EA :2539
U 12EA, 0000,013C,0180,0800,0000,1120 :2540
U 1120, 0000,003C,0180,0800,0000,11C2 :2541
U 1121, 0000,003E,0180,0A38,0000,0001 :2542
:2543
:2544
:2545
:2546
:2547
:2548
U 1122, 0000,003D,0180,0800,0000,11BE :2549
U 1123, 0800,003C,0180,0A78,0000,12EB :2550
U 12EB, 0000,0D3C,0180,0800,0000,10E5 :2551
U 10E5, 0018,003A,C180,0AF8,0000,0001 :2552
:2553
:2554
U 10E7, 0800,003C,0180,0A18,0000,12EC :2555
U 12EC, 0000,003C,01C0,0A20,0000,12ED :2556
U 12ED, 0001,2028,01C0,0800,0000,12EE :2557
U 12EE, 001D,0034,0180,0A88,0000,12EF :2558
U 12EF, 0000,003C,01C0,0A20,0000,12F0 :2559
U 12F0, 001D,0024,01C0,0A90,0000,12F1 :2560
U 12F1, 0800,003C,0180,0A08,0000,12F2 :2561
U 12F2, 001D,2000,0180,0800,0010,12F3 :2562
U 12F3, 0000,013C,0180,0800,0000,1128 :2563
U 1128, 0000,003C,0180,0800,0000,11C2 :2564
U 1129, 0000,003E,0180,0A38,0000,0001 :2565
:2566
:2567
:2568
:2569
:2570
:2571
:2572
U 112A, 0000,003D,0180,0800,0000,11BE :2573
U 112B, 0800,003C,0180,0A78,0000,12F4 :2574
U 12F4, 0000,0D3C,0180,0800,0000,10F5 :2575
U 10F5, 0018,003A,C180,0AF8,0000,0001 :2576
:2577
:2578

```

```

=0
LPERF6: ERLOOP
D_R[0F]
SIGNS?
=101 R[0F]_K[.FFFF],RETURN1
: WAS THIS CALL TO SET THE
: THE LOOP ON ERROR ADDRESS
: OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPREANDS.
: AND USE THE ALREADY
: VARIFIED FUNCTIONS
: TO CALCULATE THE EXPECTED
: RESULT.
: SET UP THE OPERANDS.
XCT6: Q_R[4]
ALU_D[ORNOT]Q,Q_ALU,R[2]_ALU : TEST INSTRUCTION
D_R[1]
XCT6B: ALU_Q-D,CLK.UBCC : RESULT CORRECT?
Z?
=0 J/ALUER2 : INCORRECT.
LAB_R[7],RETURN1
:////////////////////
:
: SUBTEST 8
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/ANDNOT FUNCTION
:
:
=0
LPERF7: ERLOOP
D_R[0F]
SIGNS?
=101 R[0F]_K[.FFFF],RETURN1
: WAS THIS CALL TO SET THE
: THE LOOP ON ERROR ADDRESS
: OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS.
: CALCULATE THE EXPECETED
: RESULT.
: SET UP THE OPERANDS.
XCT7: Q_R[4]
ALU_D[ANDNOT]Q,Q_ALU,R[2]_ALU : TEST INSTRUCTION.
D_R[1]
XCT7B: ALU_Q-D,CLK.UBCC : RESULT CORRECT?
Z?
=0 J/ALUER2 : INCORREC!
LAB_R[7],RETURN1
:////////////////////
:
: SUBTEST 9
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/XOR FUNCTION.
: NOTE: A.XOR.B= (A.ANDNOT.B).OR.(B.ANDNOT.A)
:
:
=0
LPERF8: ERLOOP
D_R[0F]
SIGNS?
=101 R[0F]_K[.FFFF],RETURN1
: WAS THIS CALL TO SET THE
: THE LOOP ON ERROR ADDRESS
: OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.

```


ZZ-ESKAH-V132 TEST 59 ALU TEST
ESKAH22.MCR MICRO2 1M(01)

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```

U 10F7, 0800,003C,0180,0A18,0000,12F5 :2579
U 12F5, 0000,003C,01C0,0A20,0000,12F6 :2580
U 12F6, 001D,0024,0180,0AD0,0000,12F7 :2581
U 12F7, 0800,003C,0180,0A18,0000,12F8 :2582
U 12F8, 0000,003C,01C0,0A20,0000,12F9 :2583
U 12F9, 001D,0024,0180,0AD8,0000,12FA :2584
U 12FA, 0800,003C,0180,0A50,0000,12FB :2585
U 12FB, 0000,003C,01C0,0A58,0000,12FC :2586
U 12FC, 001D,0030,0180,0A88,0000,12FD :2587
U 12FD, 0800,003C,0180,0A18,0000,12FE :2588
U 12FE, 0000,003C,01C0,0A20,0000,12FF :2589
U 12FF, 001D,0020,01C0,0A90,0000,1300 :2590
U 1300, 0800,003C,0180,0A08,0000,1301 :2591
U 1301, 001D,0000,0180,0800,0010,1302 :2592
U 1302, 0000,013C,0180,0800,0000,112C :2593
U 112C, 0000,003C,0180,0800,0000,11C2 :2594
U 112D, 0000,003E,0180,0A38,0000,0001 :2595
:2596
:2597
:2598
:2599
:2600
:2601
U 1130, 0000,003D,0180,0800,0000,11BE :2602
U 1131, 0800,003C,0180,0A78,0000,1303 :2603
U 1303, 0000,0D3C,0180,0800,0000,1115 :2604
U 1115, 0018,003A,C180,0AF8,0000,0001 :2605
:2606
:2607
U 1117, 0800,003C,0180,0A18,0000,1304 :2608
U 1304, 0000,003C,01C0,0A20,0000,1305 :2609
U 1305, 0001,0028,01C0,0800,0000,1306 :2610
U 1306, 001D,0014,0180,0A88,0010,1307 :2611
U 1307, 0000,1B3C,0180,0800,0000,10AE :2612
U 10AE, 0003,003C,0180,0AD0,0000,1308 :2613
U 10AF, 0018,0038,C180,0AD0,0000,1308 :2614
:2615
U 1308, 0000,003C,01C0,0A20,0000,1309 :2616
U 1309, 001D,0008,01C0,0A90,0010,130A :2617
U 130A, 0000,1B3C,0180,0800,0000,10BE :2618
U 10BE, 0000,003C,0180,0A50,0010,130C :2619
U 10BF, 0000,003C,0180,0A50,0010,130B :2620
U 130B, 0000,013C,0180,0800,0000,1132 :2621
U 1132, 0000,003C,0180,0800,0000,1139 :2622
U 1133, 0000,003C,0180,0800,0000,11C0 :2623
U 130C, 0000,013C,0180,0800,0000,1138 :2624
U 1138, 0000,003C,0180,0800,0000,11BA :2625
U 1139, 0800,003C,0180,0A08,0000,130D :2626
U 130D, 001D,0000,0180,0800,0010,130E :2627
U 130E, 0000,013C,0180,0800,0000,113A :2628
U 113A, 0000,003C,0180,0800,0000,11C2 :2629
U 113B, 0000,003E,0180,0A38,0000,0001 :2630
:2631
:2632
:2633

```

```

SIM8: D_R[3] ; SET UP THE OPERANDS.
      Q_R[4]
      ACU_D[ANDNOT]Q,R[0A]_ALU ; CALCULATE THE EXPECTED RESULT.
      D_R[3]
      Q_R[4]
      ACU_Q[ANDNOT]D,R[0B]_ALU
      D_R[0A]
      Q_R[0B]
      R[1] D.OR.Q
XCT8: D_R[3] ; SET UP THE OPERANDS.
      Q_R[4]
      ACU_D[XOR]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION.
      D_R[1]
XCT8B: ACU_Q-D,CLK.UBCC ; RESULT CORRECT?
      Z?
      =0 J/ALUER2 ; RESULT INCORRECT!
      LAB_R[7],RETURN1
://////7////////////////////////////////////
:
: SUBTEST A
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A-B-1 FUNCTION.
:
:2600
:2601
LPERF9: ERLOOP
      D_R[0F]
      SIGNS?
      =101 R[0F]_K[FFFF],RETURN1
: WAS THIS CALL TO SET THE
: THE LOOP ON ERROR ADDRESS
: OR DID AN ERROR ACTUALLY OCCUR
: WITH THE LOOP ON ERROR OPTION
: SPECIFIED BY THE USER.
: SET UP THE OPERANDS.
SIM9: D_R[3]
      Q_R[4]
      Q_NOT.Q
      R[1] D+Q,CLK.UBCC
      ALU.C?
      =1110 R[0A]_Q,J/XCT9
      R[0A]_K[FFFF],J/XCT9
: CALCULATE THE EXPECTED
: RESULT. A-B-1=A+(NOT.B)
: NOTE THAT EVEN ALU
: CARRY 31 IS SIMULATED
: HERE AND TESTED DURING
: THE ACTUAL FUNCTION A-B-1.
: SET UP THE OPERANDS.
XCT9: Q_R[4]
      ACU_D[A-B-1]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION.
      ALU.C? ; TEST ALU CARRY 31.
      =1110 ALU_R[0A],CLK.UBCC,J/XCT9C
      ALU_R[0A],CLK.UBCC
      Z?
      =0 J/XCT9D
      J/ALUERO ; ALU CARRY 31 WASN'T 0
XCT9C: Z?
      =0 J/ALUER1 ; ALU CARRY 31 WASN'T 1
XCT9D: D_R[1]
      ACU_Q-D,CLK.UBCC ; CHECK THE RESULT.
      Z?
      =0 J/ALUER2 ; RESULT INCORRECT!
      LAB_R[7],RETURN1
://////7////////////////////////////////////
:
: SUBTEST B

```


ZZ-ESKAH-V132 TEST 59 ALU TEST
ESKAH22.MCR MICRO2 1M(01)

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```

:2634 ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A+B+1 FUNCTION
:2635 :-
:2636 =0
U 1150, 0000,003D,0180,0800,0000,11BE :2637 LPERF10: ERLOOP
U 1151, 0800,003C,0180,0A78,0000,130F :2638 D R[0F]
U 130F, 0000,0D3C,0180,0800,0000,1125 :2639 SIGNS?
U 1125, 0018,003A,C180,0AF8,0000,0001 :2640 =101 R[0F]_K[.FFFF],RETURN1
:2641
:2642
:2643 SIM10: D_R[3]
:2644 Q_R[4]
:2645 Q_NOT.Q
:2646 R[1]_D-Q,CLK.UBCC
:2647 ALU.C?
:2648 =1110 R[0A]_Q,J/XCT10
:2649 R[0A]_K[.FFFF],J/XCT10
:2650 XCT10: Q_R[4]
:2651 A[U_D[A+B+1]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION
:2652 ALU.C? ; TEST THE CARRY FUNCTION.
:2653 =1110 ALU_R[0A],CLK.UBCC,J/XCT10C
:2654 ALU_R[0A],CLK.UBCC
:2655 Z?
:2656 =0 J/XCT10D
:2657 J/ALUERO ; ALU CARRY 31 WASN'T 0
:2658 XCT10C: Z?
:2659 =0 J/ALUER1 ; ALU CARRY 31 WASN'T 1
:2660 XCT10D: D_R[1]
:2661 A[U_Q-D,CLK.UBCC ; RESULT CORRECT?
:2662 Z?
:2663 =0 J/ALUER2 ; INCORRECT RESULT!
:2664 LAB_R[7],RETURN1
:2665 ;////////////////////
:2666
:2667 SUBTEST C
:2668 ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A-B(RLOG) FUNCTION
:2669 :-
:2670 =0
U 115A, 0000,003D,0180,0800,0000,11BE :2671 LPERF11: ERLOOP
U 115B, 0800,003C,0180,0A78,0000,131B :2672 D R[0F]
U 131B, 0000,0D3C,0180,0800,0000,1135 :2673 SIGNS?
U 1135, 0018,003A,C180,0AF8,0000,0001 :2674 =101 R[0F]_K[.FFFF],RETURN1
:2675
:2676
:2677 SIM11: D_R[3]
:2678 Q_R[4]
:2679 Q_NOT.Q
:2680 A[U_Q[A+B+1]D,R[1]_ALU,CLK.UBCC ; RESULT.
:2681 ALU.C? ; INCLUDING THE AFFECT ON
:2682 =1110 R[0A]_Q,J/XCT11 ; ALU CARRY 31.
:2683 R[0A]_K[.FFFF],J/XCT11
:2684 XCT11: Q_R[4]
:2685 A[U_D[A-B.RLOG]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION.
:2686 ALU.C? ; CHECK CARRY BIT.
:2687 =1110 ALU_R[0A],CLK.UBCC,J/XCT11C
:2688 ALU_R[0A],CLK.UBCC

```

```

Z?
=0      J/XCT11D
        J/ALUERO                ; ALU CARRY 31 WASN'T 0
XCT11C: Z?
=0      J/ALUER1                ; ALU CARRY 31 WASN'T 1
XCT11D: D R[1]
        A[U_Q-D,CLK.UBCC        ; CHECK THE RESULT.
Z?
=0      J/ALUER2                ; RESULT INCORRECT!
        LAB_R[7],RETURN1

```

10

```

LPERF12:      ERLOOP
              D R[OF]
              SIGNS?
=101          R[OF]_K[.FFFF],RETURN1
              D R[3]
              : WAS THIS CALL TO SET THE
              : THE LOOP ON ERROR ADDRESS
              : OR DID AN ERROR ACTUALLY OCCUR
              : WITH THE LOOP ON ERROR OPTION
              : SPECIFIED BY THE USER.
              : SET UP THE OPERANDS.

```

```

SIM12: D_R[3] ; SET UP THE OPERANDS.
        Q_R[4]
        D_NOT.D ; CALCULATE THE EXPECTED
        A[U_Q[A-B-1]D,R[1]]_ALU,CLK.UBCC ; RESULT.
        ALU.C? ; INCLUDING THE EXPECTED
=1110 R[OA]_Q,J/XCT12 ; ALU CARRY 31.
        R[OA]_K[.FFFF]
XCT12: D_R[3] ; SET UP THE OPERANDS.
        A[U_D[A+B.RLOG]Q,Q_ALU,R[2]]_ALU,CLK.UBCC ; TEST INSTRUCTION
        ALU.C? ; CHECK ALU CARRY 31.
=1110 ALU_R[OA],CLK.UBCC,J/XCT12C
        ALU_R[OA],CLK.UBCC

```

```

Z?
=0      J/XCT12D
        J/ALUERO      ; ALU CARRY 31 WASN'T 0
XCT12C: Z?
=0      J/ALUER1      ; ALU CARRY 31 WASN'T 1
XCT12D: D R[1]
        A[U_Q-D,CLK.UBCC ; CHECK THE RESULT.
        Z?
=0      J/ALUER2      ; RESULT INCORRECT!

```

```
LAB R[7],RETURN1
;NOTE THAT ON THE OCCURRENCE OF EITHER ALUERO OR ALUER1 OR
;ALUER2 THE CONTENTS OF THE RC SCRATCH PADS WHICH WILL BE DISPLAYED
;IS:
```

```

RC[OE] = EXPECTED RESULT
RC[OD] = GOT RESULT
RC[OC] = A OPERAND
RC[OB] = B OPERAND
RC[OA] = ALU FUNCTION AS GIVEN BY

```

OB A
OA B

U	115F.	0800.	003C.	0180.	0A18.	0000.	1328	:2711
U	1328.	0000.	003C.	01C0.	0A20.	0000.	1329	:2712
U	1329.	0801.	0028.	0180.	0800.	0000.	132A	:2713
U	132A.	001D.	2008.	0180.	0A88.	0010.	132B	:2714
U	132B.	0000.	1B3C.	0180.	0800.	0000.	111E	:2715
U	111E.	0003.	003C.	0180.	0AD0.	0000.	132C	:2716
U	111F.	0018.	0038.	C180.	0AD0.	0000.	132C	:2717
U	132C.	0800.	003C.	0180.	0A18.	0000.	132D	:2718
U	132D.	001D.	0018.	01C0.	0A90.	0010.	132E	:2719
U	132E.	0000.	1B3C.	0180.	0800.	0000.	112E	:2720
U	112E.	0000.	003C.	0180.	0A50.	0010.	1330	:2721
U	112F.	0000.	003C.	0180.	0A50.	0010.	132F	:2722
U	132F.	0000.	013C.	0180.	0800.	0000.	11B0	:2723
U	11B0.	0000.	003C.	0180.	0800.	0000.	11B3	:2724
U	11B1.	0000.	003C.	0180.	0800.	0000.	11C0	:2725
U	1330.	0000.	013C.	0180.	0800.	0000.	11B2	:2726
U	11B2.	0000.	003C.	0180.	0800.	0000.	11BA	:2727
U	11B3.	0800.	003C.	0180.	0A08.	0000.	1331	:2728
U	1331.	001D.	2000.	0180.	0800.	0010.	1332	:2729
U	1332.	0000.	013C.	0180.	0800.	0000.	11B8	:2730
U	11B8.	0000.	003C.	0180.	0800.	0000.	11C2	:2731
U	11B9.	0000.	003E.	0180.	0A38.	0000.	0001	:2732

```

:2744 : 09 NOT.A
:2745 : 08 A.OR.B
:2746 : 07 A.AND.B
:2747 : 06 A.OR.NOT.B
:2748 : 05 A.AND.NOT.B
:2749 : 04 A.XOR.B
:2750 : 03 A.MINUS.B.MINUS.1
:2751 : 02 A.PLUS.B.PLUS.1
:2752 : 01 A.MINUS.B (RLOG)
:2753 : 00 A.PLUS.B (RLOG)
:2754 :
:2755 :
:2756 :
:2757 :
:2758 :
:2759 :
:2760 :
:2761 :
:2762 :
:2763 :
:2764 :
:2765 :
:2766 :
:2767 :
:2768 :
:2769 :
:2770 :
:2771 :
:2772 :
:2773 :
:2774 :
:2775 :
:2776 :
:2777 :
:2778 :
:2779 :
:2780 :
:2781 :

U 11BA, 0000,003D,0180,0800,0000,1333
U 11BB, 0018,0039,0580,09C8,0000,11C4

U 11C0, 0000,003D,0180,0800,0000,1333
U 11C1, 0003,003D,0180,09C8,0000,11C4

U 11C2, 0000,003D,0180,0800,0000,1333
U 11C3, 0018,0039,0980,09C8,0000,11C4

U 1333, 0000,003C,0180,0A08,0000,1334
U 1334, 0000,003C,0180,09F0,0000,1335
U 1335, 0000,003C,0180,0A10,0000,1336
U 1336, 0000,003C,0180,09E8,0000,1337
U 1337, 0000,003C,0180,0A18,0000,1338
U 1338, 0000,003C,0180,09E0,0000,1339
U 1339, 0000,003C,0180,0A20,0000,133A
U 133A, 0000,003C,0180,09D8,0000,133B
U 133B, 0000,003C,0180,0A48,0000,133C
U 133C, 0000,003C,0180,09D0,0000,133D
U 133D, 0000,003E,0180,0800,0000,0001
U 133E, 0000,003C,0180,0800,0000,11C8

=0
ALUER1: CALL,J/ALUERX ;SET UP DATA
ERROR1,RC[9]_K[1] ;THIS ERROR DESIGNATES NO
;ALU CARRY OUT WAS DETECTED
;(ALU CR<31>=0) WHILE ONE WAS
;EXPECTED.

=0
ALUER0: CALL,J/ALUERX ;SET UP THE DATA
ERROR1,RC[9]_0 ;THIS ERROR DESIGNATES
;AN UNEXPECTED ALU CARRY OUT OCCURRED.

=0
ALUER2: CALL,J/ALUERX ;SET UP THE DATA
ERROR1,RC[9]_K[2] ;RESULT INCORRECT.
;THIS ROUTINE IS USED TO SETUP THE DATA WHEN
;AN ERROR CALL IS TO BE MADE.

ALUERX: LAB R[1]
RC[0E] LA
LAB R[2]
RC[0D] LA
LAB R[3]
RC[0C] LA
LAB R[4]
RC[0B] LA
LAB R[9]
RC[0A] LA
RETURN

ALU100: NOP

```



```

:2782 .PAGE 'TEST 5A PSL REGISTER DATA INTEGRITY'
:2783 *****
:2784 ++
:2785 TEST 5A PSL REGISTER DATA INTEGRITY
:2786
:2787 TEST DESCRIPTION
:2788 THIS TEST FLOATS A ZERO AND A ONE THRU THE PSL REGISTER BY
:2789 WRITING AND READING IT OVER THE ID BUS.
:2790
:2791 SUBTST 1 - FLOAT A ZERO THRU THE REGISTER
:2792 SUBTST 2 - FLOAT A ONE THRU THE REGISTER
:2793
:2794 LOGIC DESCRIPTION
:2795 THIS TEST CHECKS LOGIC ON BOTH THE CEH AND ICL MODULE. THE LOGIC
:2796 TESTED IS THE ID BUS TRANCEIVERS, MULTIPLEXORS INTO THE BITS OF
:2797 THE PSL, THE PSL REGISTER, THE ID BUS MULTIPLEXOR,
:2798 AND THE ID BUS ADDRESS DECODE LOGIC FOR THE PSL.
:2799
:2800 ERROR DESCRIPTION
:2801 DATA: EXPECTED VALUE OF THE PSL REGISTER
:2802 RECEIVED VALUE OF THE PSL REGISTER
:2803 LOOP COUNT--SHOWS WHAT BIT POSITION THE FLOATING ONE OR ZERO
:2804 IS CURRENTLY IN, I.E.
:2805 20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
:2806
:2807 SYNC POINT DESCRIPTION
:2808 SUBTST 1 - SYNC02--PSL IS LOADED
:2809 SYNC03--PSL IS READ
:2810 SUBTST 2 - SYNC04--PSL IS LOADED
:2811 SYNC05--PSL IS READ
:2812 --
:2813 *****
:2814 =0
:2815 CEHT1: NEWTST
:2816 RC[0F] KC.3]
:2817 D_KC.DF[CF] ; GENERATE MASK FOR PSL
:2818 D-D.SWAP.KMX/.FF
:2819 RC[0] D+K[.FF] ; SAVE
:2820 RC[5] KC.1] ; SET INITIAL PATTERN
:2821 RC[0E] KC.1] ; SET INITIAL EXPECTED VALUE
:2822 //////////////////////////////////////
:2823 +
:2824 SUBTEST 1
:2825 FIRST FLOAT A ZERO THRU THE PSL
:2826
:2827 =0
:2828 T1S1: SUBTEST
:2829 D_KC.FFFC]
:2830 D-D.SXT[WORD]+K[.2] ; GENERATE INITIAL PATTERN
:2831 RC[5] D
:2832 D-D.AND.RC[0] ; MASK EXPECTED DATA
:2833 RC[0E] D ; SAVE
:2834 RC[0C] KC.20] ; SET THE LOOP COUNT
:2835 =0
:2836 CEHT1L2:D_RC[0E]

```

U 11C8, 0000,003D,0180,0800,0000,10F4
U 11C9, 0018,0038,0D80,09F8,0000,133F
U 133F, 0818,0038,AD80,0800,0000,1340
U 1340, 0B00,003C,4980,0800,0000,1341
U 1341, 0019,0014,4980,0A80,0000,1342
U 1342, 0018,0038,0580,0AA8,0000,1343
U 1343, 0018,0038,0580,09F0,0000,11CA

U 11CA, 0000,003D,0180,0800,0000,11D4
U 11CB, 0818,0038,F180,0800,0000,1344
U 1344, 081A,4014,0980,0800,0000,1345
U 1345, 0001,003C,0180,09A8,0000,1346
U 1346, 081C,2034,0180,0A00,0000,1347
U 1347, 0001,003C,0180,09F0,0000,1348
U 1348, 0018,0038,7580,09E0,0000,11D0
U 11D0, 0000,003D,0180,0800,0000,11BE
U 11D1, 0810,0038,0180,0970,0000,1349


```

U 1349. 0000,003C,3D80,3C00,0000,134A :2837 SYNC02: ID[PSL] D ; LOAD THE PATTERN
U 134A. 0000,003C,3DF0,2C00,0000,134B :2838 SYNC03: Q_ID[PSL] ; READ IT BACK
U 134B. 001C,0034,01C0,0A00,0000,134C :2839 Q-Q.AND.R[0] ; MASK
U 134C. 001D,2000,0180,0800,0010,134D :2840 A[U_Q-D,CLK.UBCC] ; CHECK IT
U 134D. 0000,013C,0180,0800,0000,11D2 :2841 Z?
U 11D2. 0001,203D,0180,09E8,0000,11CC :2842 =0 ERROR2,R[0D] Q ; BIT IN PSL FAILED
U 11D3. 0820,003C,0380,0A28,0000,134E :2843 ALU R[5],D_ALD.LEFT,SI/MUL-, ; GENERATE NEXT PATTERN
U 134E. 0001,003C,0180,0AA8,0000,134F :2844 R[5] D
U 134F. 081C,2034,0180,0A00,0000,1350 :2845 D D.AND.R[0] ; MASK EXPECTED DATA
U 1350. 0001,003C,0180,09F0,0000,1351 :2846 R[0E] D ; SAVE
U 1351. 0810,0038,0180,0960,0000,1352 :2847 D R[0C]
U 1352. 0019,8000,0580,09E0,0010,1353 :2848 R[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
U 1353. 0000,013C,0180,0800,0000,11D8 :2849 Z?
U 11D8. 0000,003C,0180,0800,0000,11D1 :2850 =0 J/CEHT1L2
:2851 :////////////////////
:2852 :+
:2853 : SUBTEST 2
:2854 : NOW FLOAT A ONE THRU THE PSL
:2855 :-
U 11D9. 0000,003C,0180,0800,0000,11DA :2856 NOP
:2857 =0
U 11DA. 0000,003D,0180,0800,0000,11D4 :2858 T1S2: SUBTEST
U 11DB. 0018,0038,7580,09E0,0000,11E0 :2859 R[0C]_K[.20] ; SET THE LOOP COUNT
U 11E0. 0000,003D,0180,0800,0000,11BE :2860 =0 ERLOOP
U 11E1. 0810,0038,0180,0970,0000,1354 :2861 CEHT1L1: D R[0E] ; GET TEST DATA
U 1354. 0000,003C,3D80,3C00,0000,1355 :2862 SYNC04: ID[PSL] D ; LOAD THE PSL
U 1355. 0000,003C,3DF0,2C00,0000,1356 :2863 SYNC05: Q_ID[PSL] ; READ IT BACK
U 1356. 001D,2000,0180,0800,0010,1357 :2864 A[U_Q-D,CLK.UBCC] ; CHECK
U 1357. 0000,013C,0180,0800,0000,11E2 :2865 Z?
U 11E2. 0001,203D,0180,09E8,0000,11CC :2866 =0 ERROR2,R[0D] Q ; BIT IN PSL STUCK
U 11E3. 0830,0038,0180,0928,0000,1358 :2867 ALU R[5],D_AU.LEFT ; GENERATE NEXT PATTERN
U 1358. 0001,003C,0180,0AA8,0000,1359 :2868 R[5] D ; SAVE
U 1359. 081C,2034,0180,0A00,0000,135A :2869 D D.AND.R[0] ; MASK EXPECTED DATA
U 135A. 0001,003C,0180,09F0,0000,135B :2870 R[0E] D
U 135B. 0810,0038,0180,0960,0000,135C :2871 D R[0C]
U 135C. 0019,8000,0580,09E0,0010,135D :2872 R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 135D. 0000,013C,0180,0800,0000,11E4 :2873 Z?
U 11E4. 0000,003C,0180,0800,0000,11E1 :2874 =0 J/CEHT1L1 ; CONTINUE
U 11E5. 0000,003C,0180,0800,0000,11E6 :2875 NOP

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U 11E6, 0000,003D,0180,0800,0000,10F4
U 11E7, 0018,0038,D580,09F8,0000,135E
U 135E, 0018,0038,8D80,0A80,0000,135F
U 135F, 0018,0038,8D80,0A88,0000,11E8
U 11E8, 0000,003D,0180,0800,0000,11BE
U 11E9, 0800,003C,0180,0A00,0000,1360
U 1360, 0000,003C,01C0,0A08,0000,1361
U 1361, 081D,2014,0180,0A90,0000,1362
U 1362, 0019,0014,0580,0A98,0000,1363
U 1363, 0F00,003C,0180,0800,0000,1364
U 1364, 0000,003C,3D80,3C00,0000,1365
U 1365, 0000,003C,01C0,0A00,0000,1366
U 1366, 0800,003C,0180,0A08,0000,1367
U 1367, 0001,203C,0180,09E0,0000,1368
U 1368, 0001,003C,0180,09D8,0000,1369
U 1369, 081D,202C,0180,09E8,0000,136A
U 136A, 0000,003C,01C0,0A10,0000,136B
U 136B, 0001,203C,0180,09F0,0000,136C
U 136C, 001D,2000,0180,0800,0010,136D
U 136D, 0019,0114,0580,09C8,0000,11EA
U 11EA, 0003,003D,0180,09D0,0000,11C4
U 11EB, 0818,0038,0580,0800,0000,136E
U 136E, 0000,003C,3D80,3C00,0000,136F
U 136F, 0000,003C,01C0,0A00,0000,1370
U 1370, 0800,003C,0180,0A08,0000,1371
U 1371, 081D,202C,0180,09E8,0000,1372
U 1372, 0000,003C,01C0,0A18,0000,1373
U 1373, 0001,203C,0180,09F0,0000,1374
U 1374, 001D,2000,0180,0800,0010,1375
U 1375, 0019,0100,0580,09C8,0000,11EC

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.PAGE "TEST 5B ALU/A+B+PSL.C TEST"
*****
++
TEST 5B ALU/A+B+PSL.C TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ALU FUNCTION: A.PLUS.B.PLUS.PSLC.
EVERY COMBINATION OF A<3:0> AND B<3:0> IS TRIED WITH
PSL.C=0 AND WITH PSL.C=1.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
GOT RESULT
A OPERAND
B OPERAND
ERROR CODE:
0 => PSL.C FAILED AT 0
1 => PSL.C FAILED AT 1
GOT RESULT +/- 1, DEPENDING ON THE EXPECTED PSL C BIT
--
*****
=0
ABC0: NEWTST
RC[0F],K[.6]
RC[0],K[.1F] ; SET UP THE COUNTERS.
RC[1],K[.1F]
=0
ERLOOP
ABC1: D,RC[0] ; FIRST TEST THESE PATTERNS
Q,RC[1] ; WITH PSL.C=0.
ALU_Q+D,RC[2],ALU,D,ALU ; CALCULATE THE EXPECTED
ALU_D[A+B]K[.1],RC[3],ALU ; RESULT.
D,0
ID[PSL],D ; SET UP THE PSL.
Q,RC[0] ; SET UP THE OPERANDS.
D,RC[1]
RC[0C],Q
RC[0B],D
ALU_Q[A+B+PSL.C]D,RC[0D],ALU,D,ALU ; TEST INSTRUCTION.
Q,RC[2]
RC[0E],Q
ALU_Q-D,CLK,UBCC ; RESULT CORRECT?
Z?,RC[9],D+K[.1]
=0
ERROR1,RC[0A],0 ; RESULT INCORRECT!
D,K[.1] ; NOW TEST THESE PATTERNS
ID[PSL],D ; WITH PSL.C=1
Q,RC[0]
D,RC[1]
ALU_Q[A+B+PSL.C]D,RC[0D],ALU,D,ALU ; TEST INSTRUCTION.
Q,RC[3]
RC[0E],Q
ALU_Q-D,CLK,UBCC ; RESULT CORRECT?
Z?,RC[9],D-K[.1]

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ZZ-ESKAH-V132 TEST 5B ALU/A+B+PSL.C TEST
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SEQ 0182
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U 11EC, 0018,0039,0580,09D0,0000,11C4	:2931	=0	ERROR1,RCE[0A]_K[.1]	: RESULT INCORRECT!
U 11ED, 0000,003C,0180,0A08,0010,1376	:2932		ALU_R[1],CLK.DBCC	: FINISHED WITH THIS A PATTERN?
U 1376, 0000,013C,0180,0800,0000,11EE	:2933		Z?	
U 11EE, 0018,0000,0580,0A88,0000,11E9	:2934	=0	R[1]_LA-K[.1],J/ABC1	: IF NOT INCREMENT B AND CONTINUE.
U 11EF, 0000,003C,0180,0A00,0010,1377	:2935		ALU_R[0],CLK.DBCC	: FINISHED TEST?
U 1377, 0000,013C,0180,0800,0000,11F0	:2936		Z?	
U 11F0, 0018,0000,0580,0A80,0000,1378	:2937	=0	R[0]_LA-K[.1],J/ABC2	: IF NOT INCREMENT A PATTERN
	:2938			: AND GO RESET B PATTERN.
U 11F1, 0000,003C,0180,0800,0000,1379	:2939		J/ABC3	: DONE!
U 1378, 0018,0038,8D80,0A88,0000,11E9	:2940	ABC2:	R[1]_K[.1F],J/ABC1	: RESET B PATTERN AND CONTINUE.
U 1379, 0000,003C,0180,0800,0000,11F2	:2941	ABC3:	NOP	

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U 11F2, 0000,003D,0180,0800,0000,10F4
U 11F3, 0F00,003C,0180,0800,0000,11F4
U 11F4, 0000,003D,0180,0800,0000,1011
U 11F5, 0001,003C,0180,0A88,0000,11F6
U 11F6, 0F00,003D,0180,0800,0000,1013
U 11F7, 0001,003C,0180,0A80,0000,137A
U 137A, 0000,003C,01F8,0800,0000,11F8
U 11F8, 0F00,003D,0180,0800,0000,101F
U 11F9, 0001,003C,0180,0A88,0000,137B
U 137B, 0800,003C,0180,0A00,0000,11FA
U 11FA, 0800,193D,0180,0A08,0000,113C
U 11FB, 001D,0014,01C0,0800,0000,137C
U 137C, 0800,003C,0180,0A08,0010,137D
U 137D, 0000,013C,0180,0A28,0000,11FC
U 11FC, 000D,0000,0180,0A88,0000,137B
U 11FD, 0800,003C,0180,0A00,0010,137E
U 137E, 0000,013C,0180,0A28,0000,11FE
U 11FE, 000D,0000,0180,0A80,0000,11F8
U 11FF, 0F00,003C,0180,0800,0000,1200
U 1200, 0000,003D,0180,0800,0000,1012
U 1201, 0001,003C,0180,09F8,0000,1202
U 1202, 0F00,003D,0180,0800,0000,1018
U 1203, 0500,003C,0180,0800,0000,137F
U 137F, 0001,003C,0180,0800,0082,1380

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.PAGE "TEST 5C SK ROM CHECKSUM TEST"
*****
++
TEST 5C SK ROM CHECKSUM TEST

TEST DESCRIPTION
THIS IS A TEST OF THE SK ROM. EACH OF THE SK LOCATIONS
(LOCATIONS 8 THROUGH 3E)
IS REFERENCED AND A SUM IS KEPT OF THEM.
BITS <31:16> OF THIS SUM ARE THEN CLEARED.
THEN THIS 'CHECKSUM' IS COMPARED WITH THE VALUE OF
KMX/3F WHICH HAS BEEN DESIGNATED THE CHECKSUM OF THE
SK ROM.

LOGIC DESCRIPTION
TESTED HERE IS THE SK ROM, THE KMX SK INPUTS
AND THE BMX KMX INPUTS. NOTE THAT THIS TEST ASSUMES
SK LOCATION 3F CONTAINS THE CHECKSUM OF THE PREVIOUS
LOCATIONS IN THE ROM.

ERROR DESCRIPTION
EXPECTED CHECKSUM (FROM KMX/3F)
GOT CHECKSUM
--
*****
=0
KMXTO: NEWTST
D_0 ; SET UP SOME CONSTANTS
; AND COUNTERS FOR THE TEST.
=0 CALL,J/DC1 ; R[5]=1
D_0 CALL,J/DC3 ; R[0]=3
R[0]_D ; Q WILL CONTAIN THE COMMULATIVE SUM
Q_0
=0
KMX1: D_0 CALL,J/DCF ; R[1]=F
R[1]_D
; USE THE BEN D3-0? TO GET TO THE MICRO INSTRUCTIONS WHICH
; WILL ACTUALLY READ EACH SK VALUE.
KMX2: D_R[0]
=0 D_R[1],D3-0?,CALL,J/KTAB0 ; GET THE NEXT CONSTANT INTO D
ACU_D[A+B]Q,Q_ALU ; ADD THIS VALUE INTO THE
; COMMULATIVE SUM.
D_R[1],CLK,UBCC ; CHECK THE FIRST COUNTER
LAB_R[5],Z?
=0 ALU_D[A-B]LB,R[1]_ALU,J/KMX2 ; IF NOT 0 DECREMENT AND CONTINUE.
D_R[0],CLK,UBCC ; OTHERWISE CHECK THE SECOND COUNTER.
LAB_R[5],Z?
=0 ALU_D[A-B]LB,R[0]_ALU,J/KMX1 ; IF NOT 0 DECREMENT AND CONTINUE.
D_0 ; OTHERWISE CHECKSUM IS COMPLETE.
=0 CALL,J/DC2
R[0F]_D
=0 D_0 CALL,J/DC8
D_D.LEFT,S1/ZERO
SC_D ; SC=X10

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U 1380, 0803,0010,0180,0800,0000,1381 :2997
U 1381, 001D,2024,01C0,0800,0000,1382 :2998
:2999
:3000
U 1382, 0818,0038,FD80,09F0,0000,1383 :3001
U 1383, 0001,203C,0180,09E8,0000,1384 :3002
U 1384, 001D,2000,0180,0800,0010,1385 :3003
U 1385, 0000,013C,0180,0800,0000,1204 :3004
U 1204, 0000,003D,0180,0800,0000,11C4 :3005
U 1205, 0000,003C,0180,0800,0000,1386 :3006
:3007
:3008
U 113C, 0000,193C,0180,0800,0000,1140 :3009
U 113D, 0000,193C,0180,0800,0000,1160 :3010
U 113E, 0000,193C,0180,0800,0000,1170 :3011
U 113F, 0000,193C,0180,0800,0000,1180 :3012
:3013
U 1140, 0F00,003E,0180,0800,0000,0001 :3014
U 1141, 0F00,003E,0180,0800,0000,0001 :3015
U 1142, 0F00,003E,0180,0800,0000,0001 :3016
U 1143, 0F00,003E,0180,0800,0000,0001 :3017
U 1144, 0F00,003E,0180,0800,0000,0001 :3018
U 1145, 0F00,003E,0180,0800,0000,0001 :3019
U 1146, 0F00,003E,0180,0800,0000,0001 :3020
U 1147, 0F00,003E,0180,0800,0000,0001 :3021
U 1148, 0818,003A,2180,0800,0000,0001 :3022
U 1149, 0818,003A,2580,0800,0000,0001 :3023
U 114A, 0818,003A,2980,0800,0000,0001 :3024
U 114B, 0818,003A,2D80,0800,0000,0001 :3025
U 114C, 0818,003A,3180,0800,0000,0001 :3026
U 114D, 0818,003A,3580,0800,0000,0001 :3027
U 114E, 0818,003A,3980,0800,0000,0001 :3028
U 114F, 0818,003A,3D80,0800,0000,0001 :3029
:3030
U 1160, 0818,003A,4180,0800,0000,0001 :3031
U 1161, 0818,003A,4580,0800,0000,0001 :3032
U 1162, 0818,003A,4980,0800,0000,0001 :3033
U 1163, 0818,003A,4D80,0800,0000,0001 :3034
U 1164, 0818,003A,5180,0800,0000,0001 :3035
U 1165, 0818,003A,5580,0800,0000,0001 :3036
U 1166, 0818,003A,5980,0800,0000,0001 :3037
U 1167, 0818,003A,5D80,0800,0000,0001 :3038
U 1168, 0818,003A,6180,0800,0000,0001 :3039
U 1169, 0818,003A,6580,0800,0000,0001 :3040
U 116A, 0818,003A,6980,0800,0000,0001 :3041
U 116B, 0818,003A,6D80,0800,0000,0001 :3042
U 116C, 0818,003A,7180,0800,0000,0001 :3043
U 116D, 0818,003A,7580,0800,0000,0001 :3044
U 116E, 0818,003A,7980,0800,0000,0001 :3045
U 116F, 0818,003A,7D80,0800,0000,0001 :3046
:3047
U 1170, 0818,003A,8180,0800,0000,0001 :3048
U 1171, 0818,003A,8580,0800,0000,0001 :3049
U 1172, 0818,003A,8980,0800,0000,0001 :3050
U 1173, 0818,003A,8D80,0800,0000,0001 :3051

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ALU_MASK+1,D_ALU : GENERATE MASK FOR UPPER
ALU_Q[ANDNOT]D,Q_ALU : 16 BITS OF CHECKSUM.
: USE THIS MASK TO CLEAR
: BITS 16 THROUGH 31 OF Q.
D_K[3F],RC[0E],K[3F] : GET THE CHECKSUM OUT OF KMX/3F.
RC[0D] Q
ALU_Q-D,CLK.UBCC : CHECK THE SUM
Z?
=0 ERROR! : INCORRECT!
J/KMX3 : DONE
: THESE TABLES ARE USED TO REFERENCE THE KMX VALUES.
=1100
KTAB0: D3-0?,J/KTAB1
D3-0?,J/KTAB2
D3-0?,J/KTAB3
D3-0?,J/KTAB4
=0000
KTAB1: D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_0,RETURN1
D_K[8],RETURN1
D_K[9],RETURN1
D_K[0A],RETURN1
D_K[0B],RETURN1
D_K[0C],RETURN1
D_K[0D],RETURN1
D_K[0E],RETURN1
D_K[0F],RETURN1
=0000
KTAB2: D_K[10],RETURN1
D_K[11],RETURN1
D_K[12],RETURN1
D_K[13],RETURN1
D_K[14],RETURN1
D_K[15],RETURN1
D_K[16],RETURN1
D_K[17],RETURN1
D_K[18],RETURN1
D_K[19],RETURN1
D_K[1A],RETURN1
D_K[1B],RETURN1
D_K[1C],RETURN1
D_K[1D],RETURN1
D_K[1E],RETURN1
D_K[1F],RETURN1
=0000
KTAB3: D_K[20],RETURN1
D_K[21],RETURN1
D_K[22],RETURN1
D_K[23],RETURN1

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ZZ-ESKAH-V132 TEST SC SK ROM CHECKSUM TEST
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SEQ 0185
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U 1174.	0818,003A,9180,0800,0000,0001	:3052		D_K[24],RETURN1
U 1175.	0818,003A,9580,0800,0000,0001	:3053		D_K[25],RETURN1
U 1176.	0818,003A,9980,0800,0000,0001	:3054		D_K[26],RETURN1
U 1177.	0818,003A,9D80,0800,0000,0001	:3055		D_K[27],RETURN1
U 1178.	0818,003A,A180,0800,0000,0001	:3056		D_K[28],RETURN1
U 1179.	0818,003A,A580,0800,0000,0001	:3057		D_K[29],RETURN1
U 117A.	0818,003A,A980,0800,0000,0001	:3058		D_K[2A],RETURN1
U 117B.	0818,003A,AD80,0800,0000,0001	:3059		D_K[2B],RETURN1
U 117C.	0818,003A,B180,0800,0000,0001	:3060		D_K[2C],RETURN1
U 117D.	0818,003A,B580,0800,0000,0001	:3061		D_K[2D],RETURN1
U 117E.	0818,003A,B980,0800,0000,0001	:3062		D_K[2E],RETURN1
U 117F.	0818,003A,BD80,0800,0000,0001	:3063		D_K[2F],RETURN1
		:3064		
U 1180.	0818,003A,C180,0800,0000,0001	:3065	=0000	D_K[30],RETURN1
U 1181.	0818,003A,C580,0800,0000,0001	:3066	KTAB4:	D_K[31],RETURN1
U 1182.	0818,003A,C980,0800,0000,0001	:3067		D_K[32],RETURN1
U 1183.	0818,003A,CD80,0800,0000,0001	:3068		D_K[33],RETURN1
U 1184.	0818,003A,D180,0800,0000,0001	:3069		D_K[34],RETURN1
U 1185.	0818,003A,D580,0800,0000,0001	:3070		D_K[35],RETURN1
U 1186.	0818,003A,D980,0800,0000,0001	:3071		D_K[36],RETURN1
U 1187.	0818,003A,DD80,0800,0000,0001	:3072		D_K[37],RETURN1
U 1188.	0818,003A,E180,0800,0000,0001	:3073		D_K[38],RETURN1
U 1189.	0818,003A,E580,0800,0000,0001	:3074		D_K[39],RETURN1
U 118A.	0818,003A,E980,0800,0000,0001	:3075		D_K[3A],RETURN1
U 118B.	0818,003A,ED80,0800,0000,0001	:3076		D_K[3B],RETURN1
U 118C.	0818,003A,F180,0800,0000,0001	:3077		D_K[3C],RETURN1
U 118D.	0818,003A,F580,0800,0000,0001	:3078		D_K[3D],RETURN1
U 118E.	0818,003A,F980,0800,0000,0001	:3079		D_K[3E],RETURN1
U 118F.	0F00,003E,0180,0800,0000,0001	:3080		D_O,RETURN1
U 1386.	0000,003C,0180,0800,0000,1206	:3081	KMX3:	NOP

U 1206, 0000,003D,0180,0800,0000,10F4
U 1207, 0018,0038,1180,09F8,0000,1208
U 1208, 0F00,003D,0180,0800,0000,1017
U 1209, 0001,003C,0180,0AA8,0000,120A

U 120A, 0000,003D,0180,0800,0000,11D4
U 120B, 0818,0038,0580,0A98,0000,120C

U 120C, 0500,003D,0180,0800,0000,1010

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3123
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3136

```

.PAGE "TEST 5D DFMX AND SHF MUX TEST"
*****
++
TEST 5D DFMX AND SHF MUX TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ABILITY OF THE DFMX TO UNPACK THE
FRACTION OF A FLOATING POINT NUMBER. ALSO TESTED ARE
VARIOUS SHF MUX FUNCTIONS. THE DATA PATTERNS ARE
THOSE GENERATED BY FLOATING A 1 THROUGH 0'S AND A 0 THROUGH 1'S.
NOTE THAT THE SI MUX FOR THE SHF MUX IS NOT COMPREHENSIVELY
TESTED HERE (ESPECIALLY NOT SI/ALU31).
SUBTEST 1 TESTS DFMX UNPACK FRACTION
SUBTEST 2 TESTS SHF/LEFT
SUBTEST 3 TESTS SHF/RIGHT
SUBTEST 4 TESTS SHF/RIGHT2
SUBTEST 5 TESTS SHF/ALU.DT,DT/BYTE
SUBTEST 6 TESTS SHF/ALU.DT,DT/WORD
SUBTEST 7 TESTS SHF/ALU.DT,DT/LONG
SUBTEST 8 TESTS SHF/LEFT3

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
GOT RESULT
OPERAND USED
FUNCTION BEING TESTED AS GIVEN BY:
7 SHF/ALU,DFMX/FRACT
6 SHF/LEFT,SI/2
AND
SHF/LEFT,SI/7
5 SHF/RIGHT,SI/2
AND
SHF/RIGHT,SI/7
4 SHF/RIGHT2,SI/2
AND
SHF/RIGHT2,SI/7
3 SHF/ALU.DT,DT/BYTE,SI/7
2 SHF/ALU.DT,DT/WORD,SI/2
1 SHF/ALU.DT,DT/LONG,SI/2
0 SHF/LEFT3,SI/7

--
*****
=0
SHF1: NEWTST
RC[0F] K[.4]
=0 D_0,CALL,J/DC7 : SET UP FUNCTION POINTER
R[5]_D : R[5]=7
=0
SHF2: SUBTEST
D_K[.1],R[3]_K[.1] : SET UP THE INITIAL DATA PATTERN.
=0
SHF3: D_D.LEFT,SI/ZERO,CALL,J/DC0

```


U 120D, 0001,003C,0180,0AA0,0000,1387 :3137
:3138
U 1387, 0800,003C,0180,0A28,0000,120E :3139
U 120E, 0003,193D,0180,0AF8,0000,1190 :3140
:3141
U 120F, 0800,003C,0180,0A28,0000,1210 :3142
U 1210, 0000,193D,01F8,0800,0000,11A0 :3143
:3144
U 1211, 0000,0028,0180,0A98,0000,1388 :3145
U 1388, 0800,003C,01F8,0A28,0000,1212 :3146
U 1212, 0019,3901,05C0,0800,0000,11A0 :3147
U 1213, 0000,0028,0180,0A98,0000,1389 :3148
:3149
U 1389, 0000,003C,0180,0A20,0000,138A :3150
U 138A, 0018,0000,0580,0AA0,0010,138B :3151
U 138B, 0000,013C,0180,0800,0000,1214 :3152
U 1214, 0800,003C,0180,0A18,0000,138D :3153
:3154
U 1215, 0000,003C,0180,0A28,0010,138C :3155
U 138C, 0000,013C,0180,0800,0000,1216 :3156
U 138D, 0500,003C,0180,0800,0000,138E :3157
U 138E, 0001,003C,0180,0A98,0000,120F :3158
:3159
U 1216, 0018,0000,0580,0AA8,0000,120A :3160
U 1217, 0000,003C,0180,0800,0000,13ED :3161
:3162
:3163
:3164
:3165
:3166
:3167
U 1218, 0000,003D,0180,0800,0000,11BE :3168
U 1219, 0800,003C,0180,0A78,0000,138F :3169
U 138F, 0000,0D3C,0180,0800,0000,119D :3170
U 119D, 0018,003A,C180,0AF8,0000,0001 :3171
:3172
:3173
U 119F, 0800,003C,0180,0A18,0000,1390 :3174
U 1390, 0F00,003C,0180,0800,0000,1391 :3175
U 1391, 0018,0038,C180,0800,0000,121A :3176
U 121A, 0500,003D,0380,0800,0000,1010 :3177
U 121B, 0001,003C,0180,0AC0,0000,1392 :3178
U 1392, 0800,003C,01C0,0A18,0000,121C :3179
:3180
U 121C, 0500,003C,0028,0A40,0000,1393 :3181
U 121D, 0000,003C,0180,0800,0000,121E :3182
U 1393, 0018,0000,0580,0AC0,0010,1394 :3183
U 1394, 0000,013C,0180,0800,0000,121C :3184
:3185
U 121E, 0100,003D,0180,0800,0000,1010 :3186
U 121F, 0100,003C,0180,0800,0000,1395 :3187
U 1395, 0500,003C,0180,0800,0000,1396 :3188
U 1396, 0018,0038,C180,0800,0000,1397 :3189
U 1397, 0600,003C,0380,0800,0000,1398 :3190
U 1398, 0600,003C,0180,0800,0000,1399 :3191

```

R[4]_D      ; SET UP A COUNTER FOR THE
              DATA PATTERNS.
D_R[5]      ; INDEX TO THE ROUTINE
R[0F]_0,CALL,D3-0?,J/SHFLPR ; WHICH SETS UP THE LOOP ON ERROR
=0          ; ADDRESS FOR THIS FUNCTION.
SHF4: D_R[5] ; INDEX TO THE ROUTINE WHICH
=0          ; SIMULATES EXECUTES AND CHECKS
              THE RESULT OF THE FUNCTION.
R[3]_NOT.LA ; COMPLEMENT THE DATA.
Q_0,D_R[5]  ; GO TEST THE FUNCTION WITH
Q-Q-K[.1],CALL,D3-0?,J/SHFTAB ; THE COMPLEMENT PATTERN.
R[3]_NOT.LA ; COMPLEMENT THE DATA BACK TO
              ITS ORIGINAL STATE.
LAB R[4]    ; SEE IF ALL PATTERNS HAVE BEEN
R[4]_LA-K[.1],CLK.UBCC ; TESTED WITH THIS FUNCTION.
Z?          ;
=0          ; IF NOT SHIFT PATTERN AND
              CONTINUE
ALU R[5],CLK.UBCC ; OTHERWISE SEE IF ALL FUNCTIONS
Z?,J/SHF6      ; HAVE BEEN TESTED.
SHF5: D_D.LEFT,S1/ZERO ; SHIFT DATA PATTERN AND
R[3]_D,J/SHF4   ; CONTINUE TESTING THIS FUNCTION.
=0            ;
SHF6: R[5]_LA-K[.1],J/SHF2 ; TEST NEXT FUNCTION.
J/SHF100      ; DONE!
://////////
:
: SUBTEST      1
: SIMULATE, EXECUTE AND CHECK THE FUNCTION DFMX_FRACTION
:
:
=0
SLPRA: ERLOOP
D_R[0F]
SIGNS?
=101 R[0F]_K[.FFFF],RETURN1
              ; SEE IF THIS CALL WAS TO
              ; SET THE LOOP ON ERROR
              ; ADDRESS OR IF AN ERROR
              ; OCCURRED WITH THE LOOP ON ERROR
              ; OPTION SELECTED BY THE USER.
              ; SET UP THE OPERAND AND
              ; CALCULATE THE EXPECTED
              ; RESULT.
DFMxA: D_R[3]
D_0
A[U_K[.FFFF]]
=0 D_D.LEFT,S1/7,CALL,J/DC0
R[8]_D ; SHIFT COUNTER=16
Q_R[3],D_R[3]
=0
DFMxB: Q_Q.LEFT,D_D.LEFT,S1/0,LAB_R[8],J/DFMxC
J7DFMxD
DFMxC: R[8]_LA-K[.1],CLK.UBCC
Z?,J7DFMxB
=0
DFMxD: D_D.LEFT2,S1/ZERO,CALL,J/DC0
D_D.LEFT2,S1/ZERO
D_D.LEFT,S1/ZERO
A[U_K[.FFFF]]
D_D.RIGHT,S1/7 ; INSERT HIDDEN BIT.
D_D.RIGHT,S1/ZERO ; INSERT GUARD BIT.

```



```

U 1399, 0001,003C,0180,0A88,0000,139A :3192
U 139A, 0800,003C,0180,0A18,0000,139B :3193
U 139B, 0901,003C,0180,0800,0000,139C :3194
                                           :3195
                                           :3196
U 139C, 0001,003C,0180,0A90,0000,139D :3197
U 139D, 0000,003C,01C0,0A08,0000,139E :3198
U 139E, 001D,2000,0180,0800,0010,139F :3199
U 139F, 0000,013C,0180,0800,0000,1220 :3200
U 1220, 0000,003C,0180,0800,0000,13E4 :3201
U 1221, 0000,003C,01C0,0A18,0000,13A0 :3202
U 13A0, 0001,203C,01C8,0800,0000,13A1 :3203
                                           :3204
                                           :3205
U 13A1, 0001,203C,0180,0A90,0000,13A2 :3206
U 13A2, 0800,003C,0180,0A08,0000,13A3 :3207
U 13A3, 001D,2000,0180,0800,0010,13A4 :3208
U 13A4, 0000,013C,0180,0800,0000,1222 :3209
U 1222, 0000,003C,0180,0800,0000,13E4 :3210
U 1223, 0000,003E,0180,0A18,0000,0001 :3211
                                           :3212
                                           :3213
                                           :3214
                                           :3215
                                           :3216
                                           :3217
U 1224, 0000,003D,0180,0800,0000,11BE :3218
U 1225, 0800,003C,0180,0A78,0000,13A5 :3219
U 13A5, 0000,0D3C,0180,0800,0000,11AD :3220
U 11AD, 0018,003A,C180,0AF8,0000,0001 :3221
                                           :3222
                                           :3223
U 11AF, 0800,003C,0180,0A18,0000,13A6 :3224
U 13A6, 0001,203C,0180,0800,0010,13A7 :3225
U 13A7, 0000,013C,0180,0800,0000,1226 :3226
U 1226, 0500,003C,0180,0800,0000,13A9 :3227
U 1227, 0018,0038,C180,0800,0000,13A8 :3228
U 13A8, 0500,003C,0380,0800,0000,13A9 :3229
U 13A9, 0001,003C,0180,0A88,0000,13AA :3230
U 13AA, 0800,003C,0180,0A18,0000,13AB :3231
U 13AB, 0001,203C,0180,0AC8,0010,13AC :3232
U 13AC, 0000,013C,0180,0800,0000,1228 :3233
                                           :3234
U 1228, 0821,003C,0100,0A88,0000,13AD :3235
U 1229, 0821,003C,0380,0A88,0000,13AD :3236
U 13AD, 0000,003C,01C0,0A08,0000,13AE :3237
U 13AE, 001D,2000,0180,0800,0010,13AF :3238
U 13AF, 0000,013C,01C0,0A48,0000,122A :3239
U 122A, 0000,003C,0180,0800,0000,13E4 :3240
U 122B, 0000,003E,0180,0A18,0000,0001 :3241
                                           :3242
                                           :3243
                                           :3244
                                           :3245
                                           :3246

```

```

DFMXE: R[1] D ; SAVE EXPECTED RESULT.
        D_R[3] ; SET UP OPERAND.
        D_D(FRAC) ; TEST INSTRUCTION WHICH
                  ; UNPACKS THE FRACTION
                  ; INTO THE D REGISTER.
                  ; SAVE THE RESULT.

        R[2] D
        Q_R[1]
        ALU_Q-D,CLK.UBCC ; CHECK THE RESULT.
        Z?

=0 J/SHFER ; REPORT FAILURE.
DFMXF: Q_R[3] ; SET UP THE OPERAND
        Q_Q(FRAC) ; TEST INSTRUCTION WHICH
                  ; UNPACKS THE FRACTION INTO
                  ; THE Q REGISTER.
                  ; SAVE THE RESULT.

        R[2] Q
        D_R[1]
        ALU_Q-D,CLK.UBCC ; CHECK THE RESULT.
        Z?

=0 J/SHFER ; REPORT FAILURE.
        LAB_R[3],RETURN1

;//////////////////////////
;+
; SUBTEST 2
; SIMULATE, EXECUTE AND CHECK THE RESULT OF THE SHF/LEFT FUNCTION
;-

=0
SLPRB: ERLOOP
        D_R[0F] ; SEE IF THIS CALL WAS TO
        SIGNS? ; SET THE LOOP ON ERROR
=101 R[0F]_K[.FFFF],RETURN1 ; ADDRESS OR IF AN ERROR
                              ; OCCURRED WITH THE LOOP ON ERROR
                              ; OPTION SELECTED BY THE USER.

        D_R[3] ; SET UP THE OPERAND.
SHFB: ALU_Q,CLK.UBCC ; SEE IF SI/2 OR SI/7
        Z?

=0 D D.LEFT,SI/ZERO,J/SHFB1 ; CALCULATE EXPECTED RESULT.
        ALU_K[.FFFF]
        D D.LEFT,SI/7

SHFB1: R[1] D ; SAVE EXPECTED RESULT
        D_R[3] ; SET UP THE OPERAND
        R[9]_Q,CLK.UBCC
        Z?

; TEST INSTRUCTION
=0 ALU_D,SHF/LEFT,SI/2,DK/SHF,R[1]_SHF,J/SHFB2
        ALU_D,SHF/LEFT,SI/7,DK/SHF,R[1]_SHF
SHFB2: Q_R[1]
        ALU_Q-D,CLK.UBCC ; CHECK RESULT.
        Z?,Q_R[9]
=0 J/SHFER ; REPORT ERROR.
        LAB_R[3],RETURN1

;//////////////////////////
;+
; SUBTEST 3
; SIMULATE EXECUTE AND CHECK THE RESULT OF THE SHF/RIGHT FUNCTION.
;-

```

```

:3247
U 122C, 0000,003D,0180,0800,0000,11BE :3248
U 122D, 0800,003C,0180,0A78,0000,1380 :3249
U 13B0, 0000,0D3C,0180,0800,0000,11B5 :3250
U 11B5, 0018,003A,C180,0AF8,0000,0001 :3251
:3252
:3253
U 11B7, 0800,003C,0180,0A18,0000,13B1 :3254
U 13B1, 0001,203C,0180,0800,0010,13B2 :3255
U 13B2, 0000,013C,0180,0800,0000,122E :3256
U 122E, 0600,003C,0180,0800,0000,13B4 :3257
U 122F, 0018,0038,C180,0800,0000,13B3 :3258
U 13B3, 0600,003C,0380,0800,0000,13B4 :3259
U 13B4, 0001,003C,0180,0A88,0000,13B5 :3260
U 13B5, 0800,003C,0180,0A18,0000,13B6 :3261
U 13B6, 0001,203C,0180,0AC8,0010,13B7 :3262
U 13B7, 0000,013C,0180,0800,0000,1230 :3263
:3264
U 1230, 0841,003C,0100,0A90,0000,13B8 :3265
U 1231, 0841,003C,0380,0A90,0000,13B8 :3266
U 13B8, 0000,003C,01C0,0A08,0000,13B9 :3267
U 13B9, 001D,2000,0180,0800,0010,13BA :3268
U 13BA, 0000,013C,01C0,0A48,0000,1232 :3269
U 1232, 0000,003C,0180,0800,0000,13E4 :3270
U 1233, 0000,003E,0180,0A18,0000,0001 :3271
:3272
:3273
:3274
:3275
:3276
:3277
U 1234, 0000,003D,0180,0800,0000,11BE :3278
U 1235, 0800,003C,0180,0A78,0000,13B8 :3279
U 13B8, 0000,0D3C,0180,0800,0000,11BD :3280
U 11BD, 0018,003A,C180,0AF8,0000,0001 :3281
:3282
:3283
U 11BF, 0800,003C,0180,0A18,0000,13BC :3284
U 13BC, 0001,203C,0180,0800,0010,13BD :3285
U 13BD, 0000,013C,0180,0800,0000,1236 :3286
U 1236, 0200,003C,0180,0800,0000,13BF :3287
U 1237, 0018,0038,C180,0800,0000,13BE :3288
U 13BE, 0200,003C,0380,0800,0000,13BF :3289
U 13BF, 0001,003C,0180,0A88,0000,13C0 :3290
U 13C0, 0800,003C,0180,0A18,0000,13C1 :3291
U 13C1, 0001,203C,0180,0AC8,0010,13C2 :3292
U 13C2, 0000,013C,0180,0800,0000,1238 :3293
:3294
U 1238, 0881,003C,0100,0A90,0000,13C3 :3295
U 1239, 0881,003C,0380,0A90,0000,13C3 :3296
U 13C3, 0000,003C,01C0,0A08,0000,13C4 :3297
U 13C4, 001D,2000,0180,0800,0010,13C5 :3298
U 13C5, 0000,013C,01C0,0A48,0000,123A :3299
U 123A, 0000,003C,0180,0800,0000,13E4 :3300
U 123B, 0000,003E,0180,0A18,0000,0001 :3301

```

```

=0
SLPRC:  ERLOOP
        D R[0F]
        SIGNS?
: SEE IF THIS CALL WAS TO
: SET THE LOOP ON ERROR
=101    R[0F]_K[.FFFF],RETURN1
: ADDRESS OR IF AN ERROR
: OCCURRED WITH THE LOOP ON ERROR
: OPTION SELECTED BY THE USER.
: SET UP THE OPERAND.
: SEE IF SI/2 OR SI/7

        D R[3]
SHFC:   A[U_Q,CLK.UBCC
        Z?
=0      D D.RIGHT,SI/ZERO,J/SHFC1 ; CALCULATE THE EXPECTED RESULT
        A[U_K[.FFFF]
        D D.RIGHT,SI/7
SHFC1:  R[1] D
        D R[3]
        R[9]_Q,CLK.UBCC
        Z?
: SAVE THE EXPECTED RESULT.
: SET UP THE OPERAND

: TEST INSTRUCTION
=0      ALU_D,SHF/RIGHT,SI/2,DK/SHF,R[2]_SHF,J/SHFC2
        ALU_D,SHF/RIGHT,SI/7,DK/SHF,R[2]_SHF
SHFC2:  Q R[1]
        A[U_Q-D,CLK.UBCC
        Z?,Q R[9]
: CHECK THE RESULT.
=0      J/SHFER
        LAB R[3],RETURN1
: REPORT ERROR.

://////////////////////////
:
: SUBTEST      4
: SIMULATE EXECUTE AND CHECK THE RESULT OF THE SHF/RIGHT2 FUNCTION.
:
=0
SLPRD:  ERLOOP
        D R[0F]
        SIGNS?
: SEE IF THIS CALL WAS TO
: SET THE LOOP ON ERROR
=101    R[0F]_K[.FFFF],RETURN1
: ADDRESS OR IF AN ERROR
: OCCURRED WITH THE LOOP ON ERROR
: OPTION SELECTED BY THE USER.
: SET UP THE OPERAND
: SEE IF SI/2 OR SI/7

        D R[3]
SHFD:   A[U_Q,CLK.UBCC
        Z?
=0      D D.RIGHT2,SI/ZERO,J/SHFD1 ; CALCULATE THE EXPECTED RESULT
        A[U_K[.FFFF]
        D D.RIGHT2,SI/7
SHFD1:  R[1] D
        D R[3]
        R[9]_Q,CLK.UBCC
        Z?
: SAVE THE EXPECTED RESULT.
: SET UP THE OPERAND

: TEST INSTRUCTION
=0      ALU_D,SHF/RIGHT2,SI/2,DK/SHF,R[2]_SHF,J/SHFD2
        ALU_D,SHF/RIGHT2,SI/7,DK/SHF,R[2]_SHF
SHFD2:  Q R[1]
        A[U_Q-D,CLK.UBCC
        Z?,Q R[9]
: CHECK THE RESULT.
=0      J/SHFER
        LAB R[3],RETURN1
: REPORT ERROR

```

U 123C, 0000,003D,0180,0800,0000,11BE
U 123D, 0800,003C,0180,0A78,0000,13C6
U 13C6, 0000,0D3C,0180,0800,0000,11C5
U 11C5, 0018,003A,C180,0AF8,0000,0001

U 11C7, 0800,003C,0180,0A18,0000,13C7
U 13C7, 0001,003C,01E0,0A88,0000,13C8

U 13C8, 0861,803C,0380,0800,0000,13C9
U 13C9, 0001,003C,0180,0A90,0000,13CA
U 13CA, 001D,2000,0180,0800,0010,13CB
U 13CB, 0000,013C,0180,0800,0000,123E
U 123E, 0000,003C,0180,0800,0000,13E4
U 123F, 0000,003E,0180,0A18,0000,0001

U 1240, 0000,003D,0180,0800,0000,11BE
U 1241, 0800,003C,0180,0A78,0000,13CC
U 13CC, 0000,0D3C,0180,0800,0000,11CD
U 11CD, 0018,003A,C180,0AF8,0000,0001

U 11CF, 0800,003C,0180,0A18,0000,13CD
U 13CD, 0500,003C,0180,0800,0000,13CE
U 13CE, 0001,003C,01E0,0A88,0000,13CF
U 13CF, 0800,003C,0180,0A18,0000,13D0

U 13D0, 0861,403C,0100,0800,0000,13D1
U 13D1, 0001,003C,0180,0A90,0000,13D2
U 13D2, 001D,2000,0180,0800,0010,13D3
U 13D3, 0000,013C,0180,0800,0000,1242
U 1242, 0000,003C,0180,0800,0000,13E4
U 1243, 0000,003E,0180,0A18,0000,0001

U 1244, 0000,003D,0180,0800,0000,11BE
U 1245, 0800,003C,0180,0A78,0000,13D4
U 13D4, 0000,0D3C,0180,0800,0000,11D5
U 11D5, 0018,003A,C180,0AF8,0000,0001

```

:3302 :////////////////////
:3303 :+
:3304 : SUBTEST      5
:3305 : SIMULATE EXECUTE AND CHECK THE FUNCTION SHF/ALU.DT,DT/BYTE
:3306 : -
:3307 : =0
:3308 SLPRE: ERLOOP
:3309 D_R[0F]
:3310 SIGNS?
:3311 =101 R[0F]_K[.FFFF],RETURN1
:3312 :
:3313 :
:3314 D_R[3]
:3315 SHFE: Q-D,R[1] D
:3316 : TEST INSTRUCTION:
:3317 ALU D,SHF/ALU.DT,DT/BYTE,SI/7,DK/SHF
:3318 R[2] D
:3319 ALU_Q-D,CLK.UBCC
:3320 Z?
:3321 =0 J/SHFER
:3322 LAB R[3],RETURN1
:3323 :////////////////////
:3324 :+
:3325 : SUBTEST      6
:3326 : SIMULATE, EXECUTE AND CHECK THE RESULT OF THE FUNCTION SHF/ALU.DT,DT/WORD
:3327 : -
:3328 : =0
:3329 SLPRF: ERLOOP
:3330 D_R[0F]
:3331 SIGNS?
:3332 =101 R[0F]_K[.FFFF],RETURN1
:3333 :
:3334 :
:3335 D_R[3]
:3336 SHFF: D-D.LEFT,SI/ZERO
:3337 Q-D,R[1]_D
:3338 D-R[3]
:3339 : TEST INSTRUCTION:
:3340 ALU D,SHF/ALU.DT,DT/WORD,SI/2,DK/SHF
:3341 R[2] D
:3342 ALU_Q-D,CLK.UBCC
:3343 Z?
:3344 =0 J/SHFER
:3345 LAB R[3],RETURN1
:3346 :////////////////////
:3347 :+
:3348 : SUBTEST      7
:3349 : SIMULATE, EXECUTE AND CHECK THE RESULT OF SHF/ALU.DT,DT/LONG
:3350 : -
:3351 : =0
:3352 SLPRG: ERLOOP
:3353 D_R[0F]
:3354 SIGNS?
:3355 =101 R[0F]_K[.FFFF],RETURN1
:3356 :
:3357 :
:3358 : SEE IF THIS CALL WAS TO
:3359 : SET THE LOOP ON ERROR
:3360 : ADDRESS OR IF AN ERROR
:3361 : OCCURRED WITH THE LOOP ON ERROR
:3362 : OPTION SELECTED BY THE USER.
:3363 : SET UP THE OPERAND.
:3364 : SAVE EXPECTED RESULT.
:3365 :
:3366 : SAVE THE RESULT.
:3367 : CHECK THE RESULT.
:3368 :
:3369 : REPORT THE ERROR.

```



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:3357
U 11D7, 0800,003C,0180,0A18,0000,13D5 :3358
U 13D5, 0100,003C,0180,0800,0000,13D6 :3359
U 13D6, 0001,003C,01E0,0A88,0000,13D7 :3360
U 13D7, 0800,003C,0180,0A18,0000,13D8 :3361
:3362
U 13D8, 0861,003C,0100,0A90,0000,13D9 :3363
U 13D9, 001D,2000,0180,0800,0010,13DA :3364
U 13DA, 0000,013C,0180,0800,0000,1246 :3365
U 1246, 0000,003C,0180,0800,0000,13E4 :3366
U 1247, 0000,003E,0180,0A18,0000,0001 :3367
:3368
:3369
:3370
:3371
:3372
:3373
U 1248, 0000,003D,0180,0800,0000,11BE :3374
U 1249, 0800,003C,0180,0A78,0000,13DB :3375
U 13DB, 0000,0D3C,0180,0800,0000,11DD :3376
U 11DD, 0018,003A,C180,0AF8,0000,0001 :3377
:3378
:3379
U 11DF, 0800,003C,0180,0A18,0000,13DC :3380
U 13DC, 0100,003C,0180,0800,0000,13DD :3381
U 13DD, 0500,003C,0180,0800,0000,13DE :3382
U 13DE, 0001,003C,01E0,0A88,0000,13DF :3383
U 13DF, 0800,003C,0180,0A18,0000,13E0 :3384
U 13E0, 08A1,403C,0380,0800,0000,13E1 :3385
U 13E1, 0001,003C,0180,0A90,0000,13E2 :3386
U 13E2, 001D,2000,0180,0800,0010,13E3 :3387
U 13E3, 0000,013C,0180,0800,0000,124A :3388
U 124A, 0000,003C,0180,0800,0000,13E4 :3389
U 124B, 0000,003E,0180,0A18,0000,0001 :3390
:3391
:3392
:3393
U 1190, 0000,003C,0180,0800,0000,1248 :3394
U 1191, 0000,003C,0180,0800,0000,1244 :3395
U 1192, 0000,003C,0180,0800,0000,1240 :3396
U 1193, 0000,003C,0180,0800,0000,123C :3397
U 1194, 0000,003C,0180,0800,0000,1234 :3398
U 1195, 0000,003C,0180,0800,0000,122C :3399
U 1196, 0000,003C,0180,0800,0000,1224 :3400
U 1197, 0000,003C,0180,0800,0000,1218 :3401
:3402
:3403
:3404
:3405
U 11A0, 0800,003C,0180,0A18,0000,13DC :3406
U 11A1, 0800,003C,0180,0A18,0000,13D5 :3407
U 11A2, 0800,003C,0180,0A18,0000,13CD :3408
U 11A3, 0800,003C,0180,0A18,0000,13C7 :3409
U 11A4, 0800,003C,0180,0A18,0000,13BC :3410
U 11A5, 0800,003C,0180,0A18,0000,13B1 :3411

```

```

:3357
SHFG: D-R[3] ; OPTION SELECTED BY THE USER.
D-D.LEFT2,SI/ZERO ; SET UP THE OPERAND.
Q-D,R[1]_D ; CALCULATE THE EXPECTED RESULT.
D-R[3] ; SAVE THE EXPECTED RESULT.
:3361 ; SET UP THE OPERAND
: TEST INSTRUCTION:
ALU-D,SHF/ALU.DT,DT/LONG,SI/2,DK/SHF,R[2] SHF
ALU-Q-D,CLK.UBCC ; CHECK THE RESULT.
Z?
=0 J/SHFER ; REPORT THE ERROR.
LAB R[3],RETURN1
:3367
:3368
:3369
:3370
:3371
:3372
:3373
SUBTEST 8
SIMULATE, EXECUTE AND CHECK THE RESULT OF SHF/LEFT3
:3377
=0
SLPRH: ERLOOP
D-R[0F] ; SEE IF THIS CALL WAS TO
SIGNS? ; SET THE LOOP ON ERROR
=101 R[0F]_K[FFFF],RETURN1 ; ADDRESS OR IF AN ERROR
OCCURRED WITH THE LOOP ON ERROR
:3378 ; OPTION SELECTED BY THE USER.
:3379 ; SET UP THE OPERAND
SHFH: D-R[3] ; CALCULATE THE EXPECTED RESULT
D-D.LEFT2,SI/ZERO
D-D.LEFT,SI/ZERO
Q-D,R[1]_D ; SAVE THE EXPECTED RESULT.
D-R[3] ; SET UP THE OPERAND
ALU-D,SHF/LEFT3,DT/WORD,SI/7,DK/SHF ; TEST INSTRUCTION
R[2]_D ; SAVE THE RESULT
ALU-Q-D,CLK.UBCC ; CHECK THE RESULT.
Z?
=0 J/SHFER ; REPORT THE ERROR.
LAB R[3],RETURN1
:3390
: THIS TABLE IS USED TO INDEX TO THE ROUTINES WHICH SET
: THE LOOP ON ERROR ADDRESS FOR EACH FUNCTION.
=0000
SHFLPR: J/SLPRH
J/SLPRG
J/SLPRF
J/SLPRE
J/SLPRD
J/SLPRC
J/SLPRB
J/SLPRA
=
: THIS TABLE IS USED TO INDEX TO THE ROUTINE WHICH
: SIMULATES EXECUTES AND CHECKS THE RESULT OF EACH FUNCTION.
=0000
SHFTAB: D-R[3],J/SHFH
D-R[3],J/SHFG
D-R[3],J/SHFF
D-R[3],J/SHFE
D-R[3],J/SHFD
D-R[3],J/SHFC

```


ZZ-ESKAH-V132 TEST 5D DFMX AND SHF MUX TEST
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U 11A6, 0800,003C,0180,0A18,0000,13A6 :3412
U 11A7, 0800,003C,0180,0A18,0000,1390 :3413

D_R[3],J/SHFB
D_R[3],J/DFMXA

=
: WHEN AN ERROR IS DETECTED THE CONTENTS OF THE RC REGISTERS
: WILL BE TYPED:

RC[OE] = EXPECTED RESULT
RC[OD] = GOT RESULT
RC[OC] = OPERAND
RC[OB] = FUNCTION, AS DEFINED BELOW

7	SHF/ALU,DFMX/FRACT.
6	SHF/LEFT,SI/2
	AND
	SHF/LEFT,SI/7
5	SHF/RIGHT,SI/2
	AND
	SHF/RIGHT,SI/7
4	SHF/RIGHT2,SI/2
	AND
	SHF/RIGHT2,SI/7
3	SHF/ALU.DT,DT/BYTE,SI/7
2	SHF/ALU.DT,DT/WORD,SI/2
1	SHF/ALU.DT,DT/LONG,SI/2
0	SHF/LEFT3,SI/7

U 13E4, 0000,003C,0180,0A08,0000,13E5 :3438
U 13E5, 0000,003C,0180,09F0,0000,13E6 :3439
U 13E6, 0000,003C,0180,0A10,0000,13E7 :3440
U 13E7, 0000,003C,0180,09E8,0000,13E8 :3441
U 13E8, 0000,003C,0180,0A18,0000,13E9 :3442
U 13E9, 0000,003C,0180,09E0,0000,13EA :3443
U 13EA, 0000,003C,0180,0A28,0000,13EB :3444
U 13EB, 0000,003C,0180,09D8,0000,13EC :3445
U 13EC, 0000,003D,0180,0800,0000,11C4 :3446
U 13ED, 0000,003C,0180,0800,0000,124C :3447
U 124C, 0000,003D,0180,0800,0000,10F4 :3448
:3449

SHFER: LAB R[1]
RC[OE] LA
LAB R[2]
RC[OD] LA
LAB R[3]
RC[OC] LA
LAB R[5]
RC[OB] LA
ERROR1

SHF100: NOP
=0
DUMMY1: NEWTST

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	1839	2395=	1840	2398=
U 1008	1862=	1863=	1972=	1973=	1975=	1976=	2258=	2259=
U 1010	1953=	1954=	1955=	1956=	1957=	1958=	1959=	1960=
U 1018	1961=	1962=	1963=	1964=	1965=	1966=	1967=	1968=
U 1020	2001=	2002=	2003=	2004=	2005=	2006=	2007=	2008=
U 1028	2009=	2010=	2011=	2012=	2013=	2014=	2015=	2016=
U 1030	2046=	2047=	2048=	2049=	2050=	2051=	2052=	2053=
U 1038	2054=	2055=	2056=	2057=	2058=	2059=	2060=	2061=
U 1040	2018=	2019=	2022=	2023=	1841	2416=	1842	2419=
U 1048	2034=	2035=	2120=	2121=	1843	2437=	1902:	2440=
U 1050	2123=	2124=	2126=	2127=	1844	2460=	1864	2463=
U 1058	2131=	2132=	1905:	1865	1866	2494=	1908:	2497=
U 1060	2064=	2065=	2066=	2067=	2068=	2069=	2070=	2071=
U 1068	2072=	2073=	2074=	2075=	2076=	2077=	2078=	2079=
U 1070	2083=	2084=	2085=	2086=	2087=	2088=	2089=	2090=
U 1078	2091=	2092=	2093=	2094=	2095=	2096=	2097=	2098=
U 1080	2101=	2102=	2103=	2104=	2105=	2106=	2107=	2108=
U 1088	2109=	2110=	2111=	2112=	2113=	2114=	2115=	2116=
U 1090	2134=	2135=	2469=	2470=	2137=	2138=	2471=	2472=
U 1098	2233=	2234=	2243=	2244=	2249=	2250=	2269=	2270=
U 10A0	2357=	2358=	2359=	2360=	2361=	2362=	2363=	2364=
U 10A8	2365=	2366=	2367=	2368=	2275=	2276=	2613=	2614=
U 10B0	2373=	2374=	2375=	2376=	2377=	2378=	2379=	2380=
U 10B8	2381=	2382=	2383=	2384=	2279=	2280=	2619=	2620=
U 10C0	2282=	2283=	2503=	2504=	2290=	2291=	2505=	2506=
U 10C8	2298=	2299=	2301=	2302=	2307=	2308=	2648=	2649=
U 10D0	2315=	2316=	2317=	2318=	1867	2528=	1868	2531=
U 10D8	2326=	2328=	2330=	2331=	2336=	2337=	2653=	2654=
U 10E0	2343=	2344=	2347=	2348=	1869	2552=	1870	2555=
U 10E8	2350=	2353=	2392=	2393=	2405=	2406=	2682=	2683=
U 10F0	2413=	2414=	2426=	2427=	1880	2576=	1881	2579=
U 10F8	2434=	2435=	2449=	2450=	2457=	2458=	2687=	2688=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1882	2475=	2476=	1834:	1835:	1836:	1837:
U 1110	2483=	2484=	2491=	2492=	1883	2605=	1884	2608=
U 1118	2509=	2510=	2517=	2518=	2525=	2526=	2716=	2717=
U 1120	2541=	2542=	2549=	2550=	1885	2640=	1886	2643=
U 1128	2564=	2565=	2573=	2574=	2594=	2595=	2721=	2722=
U 1130	2602=	2603=	2622=	2623=	1887	2674=	1888	2677=
U 1138	2625=	2626=	2629=	2630=	3009=	3010=	3011=	3012=
U 1140	3014=	3015=	3016=	3017=	3018=	3019=	3020=	3021=
U 1148	3022=	3023=	3024=	3025=	3026=	3027=	3028=	3029=
U 1150	2637=	2638=	2656=	2657=	1889	1928:	2659=	2660=
U 1158	2663=	2664=	2671=	2672=	1890	2708=	1891	2711=
U 1160	3031=	3032=	3033=	3034=	3035=	3036=	3037=	3038=
U 1168	3039=	3040=	3041=	3042=	3043=	3044=	3045=	3046=
U 1170	3048=	3049=	3050=	3051=	3052=	3053=	3054=	3055=
U 1178	3056=	3057=	3058=	3059=	3060=	3061=	3062=	3063=
U 1180	3065=	3066=	3067=	3068=	3069=	3070=	3071=	3072=
U 1188	3073=	3074=	3075=	3076=	3077=	3078=	3079=	3080=
U 1190	3394=	3395=	3396=	3397=	3398=	3399=	3400=	3401=
U 1198	2690=	2691=	2693=	2694=	1892	3171=	1893	3174=

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3406=	3407=	3408=	3409=	3410=	3411=	3412=	3413=
U 11A8	2697=	2698=	2705=	2706=	1894	3221=	1895	3224=
U 11B0	2724=	2725=	2727=	2728=	1896	3251=	1897	3254=
U 11B8	2731=	2732=	2756=	2757=	1898	3281=	1899	3284=
U 11C0	2762=	2763=	2766=	2767=	1900	3311=	1901	3314=
U 11C8	2815=	2816=	2828=	2829=	1903	3332=	1904	3335=
U 11D0	2835=	2836=	2842=	2843=	1936	3355=	1937	3358=
U 11D8	2850=	2856=	2858=	2859=	1943	3377=	1944	3380=
U 11E0	2860=	2861=	2866=	2867=	2874=	2875=	2901=	2902=
U 11E8	2905=	2906=	2921=	2922=	2931=	2932=	2934=	2935=
U 11F0	2937=	2939=	2969=	2970=	2971=	2972=	2973=	2974=
U 11F8	2977=	2978=	2982=	2983=	2987=	2988=	2990=	2991=
U 1200	2992=	2993=	2994=	2995=	3005=	3006=	3128=	3129=
U 1208	3130=	3131=	3133=	3134=	3136=	3137=	3140=	3142=
U 1210	3143=	3145=	3147=	3148=	3153=	3155=	3160=	3161=
U 1218	3168=	3169=	3177=	3178=	3181=	3182=	3186=	3187=
U 1220	3201=	3202=	3210=	3211=	3218=	3219=	3227=	3228=
U 1228	3235=	3236=	3240=	3241=	3248=	3249=	3257=	3258=
U 1230	3265=	3266=	3270=	3271=	3278=	3279=	3287=	3288=
U 1238	3295=	3296=	3300=	3301=	3308=	3309=	3321=	3322=
U 1240	3329=	3330=	3344=	3345=	3352=	3353=	3366=	3367=
U 1248	3374=	3375=	3389=	3390=	3449=	1945	1948	1949
U 1250	1950	1951	1969	1970	1974	1977	1978	1979
U 1258	1980	1981	1982	1983	1984	1985	1986	1987
U 1260	1988	1989	1990	1991	1992	1993	1994	1995
U 1268	1996	2017	2024	2025	2026	2027	2028	2029
U 1270	2030	2031	2036	2037	2038	2039	2040	2041
U 1278	2042	2043	2125	2136	2245	2246	2247	2248
U 1280	2251	2252	2253	2254	2255	2256	2257	2260
U 1288	2261	2262	2263	2264	2265	2266	2267	2268
U 1290	2281	2284	2285	2286	2292	2293	2294	2295
U 1298	2296	2297	2300	2303	2305	2306	2309	2319
U 12A0	2320	2321	2322	2323	2324	2325	2329	2332
U 12A8	2333	2334	1929:	2335	2339	2340	2341	2342
U 12B0	2345	2394	2399	2400	2401	2402	2403	2404
U 12B8	2415	2420	2421	2422	2423	2424	2425	2436
U 12C0	2441	2442	2443	2444	2445	2446	2447	2448
U 12C8	2459	2464	2465	2466	2467	2473	2474	2477
U 12D0	2478	2479	2480	2481	2482	2493	2498	2499
U 12D8	2500	2501	2507	2508	2511	2512	2513	2514
U 12E0	2515	2516	2527	2532	2533	2534	2536	2537
U 12E8	2538	2539	2540	2551	2556	2557	2558	2559
U 12F0	2560	2561	2562	2563	2575	2580	2581	2582
U 12F8	2583	2584	2585	2586	2587	2588	2589	2590
U 1300	2591	2592	2593	2604	2609	2610	2611	2612
U 1308	2616	2617	2618	2621	2624	2627	2628	2639
U 1310	2644	2645	2646	2647	2650	2651	2652	2655
U 1318	2658	2661	2662	2673	2678	2679	2680	2681
U 1320	2684	2685	2686	2689	2692	2695	2696	2707
U 1328	2712	2713	2714	2715	2718	2719	2720	2723
U 1330	2726	2729	2730	2770	2771	2772	2773	2774
U 1338	2775	2776	2777	2778	2779	2780	2781	2817
U 1340	2818	2819	2820	2821	2830	2831	2832	2833

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U 1348	2834	2837	2838	2839	2840	2841	2844	2845
U 1350	2846	2847	2848	2849	2862	2863	2864	2865
U 1358	2868	2869	2870	2871	2872	2873	2903	2904
U 1360	2907	2908	2909	2910	2911	2912	2913	2914
U 1368	2915	2916	2917	2918	2919	2920	2923	2924
U 1370	2925	2926	2927	2928	2929	2930	2933	2936
U 1378	2940	2941	2975	2981	2985	2986	2989	2996
U 1380	2997	2998	3001	3002	3003	3004	3081	3139
U 1388	3146	3150	3151	3152	3156	3157	3158	3170
U 1390	3175	3176	3179	3183	3184	3188	3189	3190
U 1398	3191	3192	3193	3194	3197	3198	3199	3200
U 13A0	3203	3206	3207	3208	3209	3220	3225	3226
U 13A8	3229	3230	3231	3232	3233	3237	3238	3239
U 13B0	3250	3255	3256	3259	3260	3261	3262	3263
U 13B8	3267	3268	3269	3280	3285	3286	3289	3290
U 13C0	3291	3292	3293	3297	3298	3299	3310	3315
U 13C8	3317	3318	3319	3320	3331	3336	3337	3338
U 13D0	3340	3341	3342	3343	3354	3359	3360	3361
U 13D8	3363	3364	3365	3376	3381	3382	3383	3384
U 13E0	3385	3386	3387	3388	3438	3439	3440	3441
U 13E8	3442	3443	3444	3445	3446	3447		
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F6	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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	Words not in bounds
ESKOODEF	0
ESKOO MAC	0
ESKAHMAC	0
ESKAH22	1022

Used	1022
Remaining	

Total microwords used in memory U: 1022
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

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ESKAM22.MCR

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; The files used in this assembly are:

ESKOODEF.MIC

ESKOOMAC.MIC

ESKAMMAC.MIC

ESKAM22.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

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: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2139	TEST 5E SC AND KMX/SC TEST
: 2209	TEST 5F SC BEN TEST A
: 2256	TEST 60 SC BEN TEST B
: 2295	TEST 61 SC BEN TEST C
: 2376	TEST 62 MASK TEST
: 2412	TEST 63 SMX/ALU.EXP TEST
: 2464	TEST 64 DAL SHIFTER TEST
: 2593	TEST 65 EALU/A+1, EAMX/SC AND SMX/EALU TEST
: 2646	TEST 66 EALU/A TEST
: 2696	TEST 67 EBMX/KMX AND EALU/B TEST
: 2745	TEST 68 FE AND SMX/FE TEST
: 2795	TEST 69 EBMX/FE TEST
: 2845	TEST 6A EBMX/AMX.EXP TEST
: 2902	TEST 6B STATE REGISTER AND EAMX/STATE TEST
: 2965	TEST 6C EALU TEST
: 3302	TEST 6D EALU/NABS.A-B TEST
: 3348	TEST 6E EALU/NABS.A-B ROM TEST

22-ESKAH-V132 Subroutines
ESKAH23.MCR

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:1
:1804
:1805

.NOLIST
.LIST

TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF]. R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED. THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN R[OF] AND DO A RETURN.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL TO THE CONSOLE.

U 1100, 0000,003C,1980,0800,0084,7005
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7005
U 110D, 0000,003C,8980,0800,0084,7005
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7005
U 1001, 0000,003C,81F0,2C00,0000,1002
U 1002, 0C00,003C,01E0,0800,0000,1006
U 1006, 0000,003C,8180,3C00,0000,100C
U 100C, 0C00,003C,01E0,0800,0000,100E
U 100E, 0000,003C,01C0,0A78,0000,1042
U 1042, 0001,2024,0180,0800,0010,1046
U 1046, 0000,013C,0180,0800,0000,1004
U 1004, 0001,2036,0180,0AF8,0000,0000

1100: SC_K[ZERO],J/TRPH1 ; SYSTEM INIT
1101: SC_K[.1],J/TRPH0 ; DATA UNALIGNED
1102: SC_K[.2],J/TRPH0 ; X PAGE ERROR
1103: SC_K[.3],J/TRPH0 ; TB MODIFY
1104: SC_K[.4],J/TRPH0 ; TB PROT ERROR
1105: SC_K[.6],J/TRPH0 ; TB MISS
1106: SC_K[.9],J/TRPH0 ; RES FLOAT OPER
1107: SC_K[.7],J/TRPH0 ; TB PARITY
1108: SC_K[.8],J/TRPH0 ; CACHE PARITY
110C: SC_K[.C],J/TRPH1 ; RDS
110D: SC_K[.D],J/TRPH1 ; TIME OUT
110E: SC_K[.10],J/TRPH0 ; ODD ADDRESS
110F: SC_K[.F],J/TRPH1 ; CS PARITY
TRPH0: Q_ID[USTACK]
Q_D,U Q
ID[USTACK]_D
Q_D,D Q
Q-R[OF]
ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU_Q.AND.MASK,R[OF]_ALU,RETURN ; CLEAR THE BIT AND RETURN

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED. IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
TRAP CODE--INDICATES WHICH TRAP OCCURRED
FAULT STATUS REGISTER
SBI ERROR REGISTER
TIMEOUT ADDRESS REGISTER
MAINTENANCE REGISTER
CACHE PARITY REGISTER
TB ERROR REGISTER 1
TB ERROR REGISTER 0

```

U 1005, 0018,0038,1D80,09E8,0000,1008 :1861
U 1008, 0000,003D,D980,0800,0084,71F7 :1862
U 1009, 0000,003C,49F0,2C00,0000,104C :1863
U 104C, 0001,203C,4DF0,2DB0,0000,1054 :1864
U 1054, 0001,203C,65F0,2DB8,0000,1056 :1865
U 1056, 0001,203C,6DF0,2DD8,0000,1097 :1866
U 1097, 0001,203C,75F0,2DE0,0000,10A7 :1867
U 10A7, 0001,203C,79F0,2DC8,0000,10AA :1868
U 10AA, 0001,203C,69F0,2DC0,0000,10AE :1869
U 10AE, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,111E :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 10B2, 0000,003C,65F8,0800,0084,70B6 :1880
U 10B6, 0818,0038,8D80,0800,0000,10BC :1881
U 10BC, 0D00,003C,0180,0800,0000,10BE :1882
U 10BE, 0000,003C,3D80,3C00,0000,10C4 :1883
U 10C4, 0818,0038,0580,0800,0000,10C6 :1884
U 10C6, 0D00,003C,0180,0800,0000,10DC :1885
U 10DC, 0F00,003C,3180,3C00,0000,10DE :1886
U 10DE, 0000,003C,5D80,3C00,0000,10E4 :1887
U 10E4, 0000,003C,3980,3C00,0000,10E6 :1888
U 10E6, 0000,003C,2980,3C00,0000,10EC :1889
U 10EC, 0000,003C,4980,3C00,0000,10EE :1890
U 10EE, 0818,0038,C180,0800,0000,10F4 :1891
U 10F4, 0000,003C,6580,3C00,0000,10F6 :1892
U 10F6, 0F00,003C,6D80,3C00,0000,10FC :1893
U 10FC, 0000,003C,6D80,3C00,0000,10FE :1894
U 10FE, 0000,003C,6580,3C00,0000,1109 :1895
U 1109, 0003,003C,0180,09F0,0000,1114 :1896
U 1114, 0003,003C,0180,0AF8,0000,1116 :1897
U 1116, 0003,003C,0180,09E8,0000,105E :1898
U 111C, 0818,0038,0980,0800,0000,105E :1899
U 111E, 0810,0038,0180,0978,0000,1154 :1900
U 1154, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 11F3, 0810,0038,0180,0978,0000,11F4 :1903
U 11F4, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905
:1906
:1907
U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

```

```

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q ID[TBER0]
RC[6] Q,Q ID[TBER1]
RC[7] Q,Q ID[SBI.ERR]
RC[0B] Q,Q ID[FAULT]
RC[0C] Q,Q ID[MAINT]
RC[9] Q,Q ID[PARITY]
RC[8] Q,Q ID[TIME.ADDR]
RC[0A] Q,Q ID[USTACK]
1000: RC[0E] Q,ERROR1
:
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2
:
SCOPE: SC K[.10],Q_0 ; SETUP TO WRITE IPL OF 1F
D_K[.1F] ; ...
D-DAL.SC
ID[PSL] D ; WRITE THE PSL
D_K[.1] ; SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES] D,D_0 ; CLEAR THE CES REGISTER
ID[ACC.[S]] D ; SHUT OFF THE FLOATING POINT
ID[SIR] D ; CLEAR THE SIR REGISTER
ID[CLK.[S]] D ; STOP INTERVAL TIMER
ID[TBER0] D ; SHUT OFF THE TB
D_K[FFFF]
ID[SBI.ERR] D
ID[FAULT] D,D_0
ID[FAULT] D
ID[SBI.ERR] D
RC[0E] 0
RC[0F] 0
RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D-RC[0F]
D-D.AND.K[.FF00]
104E: D-D.OR.K[.4],J/CALLCON
ERROR2: D-RC[0F]
D-D.AND.K[.FF00]
105A: D-D.OR.K[.6],J/CALLCON
105E:
CALLCON: ID[TXDB] D,J/CALLCON ; CALL THE CONSOLE
:
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
:
13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,11F5 :1929

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

:+
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:-

SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

:+
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:-

SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX

=0000

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D,D.LEFT2,SI/7,RETURN1
DC.6: Q_K[.8]

:1930
:1931
:1932
:1933
:1934
:1935
U 11F5, 0810,0038,4D80,0978,0000,11F6 :1936
U 11F6, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 11F7, 0010,0038,01C0,0978,0000,11F8 :1943
U 11F8, 0019,2034,4DC0,0800,0000,11F9 :1944
U 11F9, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
U 11FA, 0118,0038,1B80,0800,0000,11FE :1948
U 11FB, 0118,0038,0B80,0800,0000,11FE :1949
U 11FC, 0118,0038,0780,0800,0000,11FE :1950
U 11FD, 0118,0038,C380,0800,0000,11FE :1951
:1952
U 1010, 0018,0038,1980,0800,0000,11FA :1953
U 1011, 0018,0038,1980,0800,0000,11FB :1954
U 1012, 0018,0038,1980,0800,0000,11FC :1955
U 1013, 0018,0038,1980,0800,0000,11FD :1956
U 1014, 0018,0038,0980,0800,0000,11FA :1957
U 1015, 0018,0038,0980,0800,0000,11FB :1958
U 1016, 0018,0038,0980,0800,0000,11FC :1959
U 1017, 0018,0038,0980,0800,0000,11FD :1960
U 1018, 0018,0038,0580,0800,0000,11FA :1961
U 1019, 0018,0038,0580,0800,0000,11FB :1962
U 101A, 0018,0038,0580,0800,0000,11FC :1963
U 101B, 0018,0038,0580,0800,0000,11FD :1964
U 101C, 0018,0038,C180,0800,0000,11FA :1965
U 101D, 0018,0038,C180,0800,0000,11FB :1966
U 101E, 0018,0038,C180,0800,0000,11FC :1967
U 101F, 0018,0038,C180,0800,0000,11FD :1968
U 11FE, 0100,003E,0380,0800,0000,0001 :1969
U 11FF, 0018,0038,01C0,0800,0000,100A :1970


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:1971
U 100A, 0000,003D,0180,0800,0000,1016 :1972
U 100B, 0019,2000,05C0,0800,0010,1200 :1973
U 1200, 0000,013C,0180,0800,0000,1040 :1974
U 1040, 0000,003C,0180,0800,0000,100A :1975
U 1041, 0000,003E,0180,0800,0000,0001 :1976
U 1201, 0018,0038,0580,0800,0000,1202 :1977
U 1202, 0118,0038,0780,0800,0000,1203 :1978
U 1203, 0118,0038,0780,0800,0000,1204 :1979
U 1204, 0118,0038,0780,0800,0000,1205 :1980
U 1205, 0118,0038,0780,0800,0000,1206 :1981
U 1206, 0118,0038,0780,0800,0000,1207 :1982
U 1207, 0118,0038,0780,0800,0000,1208 :1983
U 1208, 0118,0038,0780,0800,0000,1209 :1984
U 1209, 0100,003E,0380,0800,0000,0001 :1985
U 120A, 0018,0038,0980,0800,0000,120B :1986
U 120B, 0218,0038,0B80,0800,0000,120C :1987
U 120C, 0218,0038,0B80,0800,0000,120D :1988
U 120D, 0218,0038,0B80,0800,0000,120E :1989
U 120E, 0218,0038,0B80,0800,0000,120F :1990
U 120F, 0218,0038,0B80,0800,0000,1210 :1991
U 1210, 0218,0038,0B80,0800,0000,1211 :1992
U 1211, 0218,0038,0B80,0800,0000,1212 :1993
U 1212, 0200,003E,0380,0800,0000,0001 :1994
U 1213, 0F00,003C,0180,0800,0000,1214 :1995
U 1214, 0819,0000,0580,0800,0000,1010 :1996
:1997
:1998
:1999
:2000
U 1020, 0019,2000,05C0,0800,0000,1021 :2001
U 1021, 0019,2000,05C0,0800,0000,1022 :2002
U 1022, 0019,2000,05C0,0800,0000,1023 :2003
U 1023, 0019,2000,05C0,0800,0000,1024 :2004
U 1024, 0019,2000,05C0,0800,0000,1025 :2005
U 1025, 0019,2000,05C0,0800,0000,1026 :2006
U 1026, 0019,2000,05C0,0800,0000,1027 :2007
U 1027, 0019,2000,05C0,0800,0000,1028 :2008
U 1028, 0019,2000,05C0,0800,0000,1029 :2009
U 1029, 0019,2000,05C0,0800,0000,102A :2010
U 102A, 0019,2000,05C0,0800,0000,102B :2011
U 102B, 0019,2000,05C0,0800,0000,102C :2012
U 102C, 0019,2000,05C0,0800,0000,102D :2013
U 102D, 0019,2000,05C0,0800,0000,102E :2014
U 102E, 0019,2000,05C0,0800,0000,102F :2015
U 102F, 0001,203C,0180,0800,0010,1215 :2016
U 1215, 001D,2114,01C0,0800,0000,1044 :2017
U 1044, 0000,003E,0180,0800,0000,0001 :2018
U 1045, 0000,003E,0180,0800,0000,0002 :2019
:2020
:2021
U 1048, 0000,003D,0180,0800,0000,1216 :2022
U 1049, 0000,003C,0180,0800,0000,1216 :2023
U 1216, 0000,003C,01A8,0800,0000,1217 :2024
U 1217, 0000,003C,01A8,0800,0000,1218 :2025

```

```

=0
DC.6A: CALL,J/DC6
      ALU_Q-K[.1],Q_ALU,CLK.UBCC
      Z?
=0
      J/DC.6A
      RETURN1
DCAAAA: ALU_K[.1]
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        D_D.LEFT2,SI/7,RETURN1
DRAAAA: ALU_K[.2]
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        D_D.RIGHT2,SI/7,RETURN1
DC.NF: D_0
        D_D-K[.1],J/DC0
; THIS TABLE IS USED AS A TARGET TO TEST BRANCHES.
; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
=0000
BRTBLE: Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
BRT1:  Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
BRT2:  Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        ALU_Q,CLK.UBCC
        Z?,ALU_Q+D,Q_ALU
=0
      RETURN1
      RETURN2
; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
=0
SHQLFT16: CALL,J/SHQLFT8
          J/SHQLFT8
SHQLFT8:  Q_Q.LEFT,SI/3
SHQLFT7:  Q_Q.LEFT,SI/3

```



```

U 1218, 0000,003C,01A8,0800,0000,1219 :2026
U 1219, 0000,003C,01A8,0800,0000,121A :2027
U 121A, 0000,003C,01A8,0800,0000,121B :2028
U 121B, 0000,003C,01A8,0800,0000,121C :2029
U 121C, 0000,003C,01A8,0800,0000,121D :2030
U 121D, 0000,003E,01A8,0800,0000,0001 :2031
:2032
:2033
U 104A, 0000,003D,0180,0800,0000,121E :2034
U 104B, 0000,003C,0180,0800,0000,121E :2035
U 121E, 0000,003C,03A8,0800,0000,121F :2036
U 121F, 0000,003C,03A8,0800,0000,1220 :2037
U 1220, 0000,003C,03A8,0800,0000,1221 :2038
U 1221, 0000,003C,03A8,0800,0000,1222 :2039
U 1222, 0000,003C,03A8,0800,0000,1223 :2040
U 1223, 0000,003C,03A8,0800,0000,1224 :2041
U 1224, 0000,003C,03A8,0800,0000,1225 :2042
U 1225, 0000,003E,03A8,0800,0000,0001 :2043
:2044
:2045
U 1030, 0001,203E,0180,0A80,0000,0001 :2046
U 1031, 0001,203E,0180,0A88,0000,0001 :2047
U 1032, 0001,203E,0180,0A90,0000,0001 :2048
U 1033, 0001,203E,0180,0A98,0000,0001 :2049
U 1034, 0001,203E,0180,0AA0,0000,0001 :2050
U 1035, 0001,203E,0180,0AA8,0000,0001 :2051
U 1036, 0001,203E,0180,0AB0,0000,0001 :2052
U 1037, 0001,203E,0180,0AB8,0000,0001 :2053
U 1038, 0001,203E,0180,0AC0,0000,0001 :2054
U 1039, 0001,203E,0180,0AC8,0000,0001 :2055
U 103A, 0001,203E,0180,0AD0,0000,0001 :2056
U 103B, 0001,203E,0180,0AD8,0000,0001 :2057
U 103C, 0001,203E,0180,0AE0,0000,0001 :2058
U 103D, 0001,203E,0180,0AE8,0000,0001 :2059
U 103E, 0001,203E,0180,0AF0,0000,0001 :2060
U 103F, 0001,203E,0180,0AF8,0000,0001 :2061
:2062
:2063
U 1060, 0001,203E,0180,0980,0000,0001 :2064
U 1061, 0001,203E,0180,0988,0000,0001 :2065
U 1062, 0001,203E,0180,0990,0000,0001 :2066
U 1063, 0001,203E,0180,0998,0000,0001 :2067
U 1064, 0001,203E,0180,09A0,0000,0001 :2068
U 1065, 0001,203E,0180,09A8,0000,0001 :2069
U 1066, 0001,203E,0180,09B0,0000,0001 :2070
U 1067, 0001,203E,0180,09B8,0000,0001 :2071
U 1068, 0001,203E,0180,09C0,0000,0001 :2072
U 1069, 0001,203E,0180,09C8,0000,0001 :2073
U 106A, 0001,203E,0180,09D0,0000,0001 :2074
U 106B, 0001,203E,0180,09D8,0000,0001 :2075
U 106C, 0001,203E,0180,09E0,0000,0001 :2076
U 106D, 0001,203E,0180,09E8,0000,0001 :2077
U 106E, 0001,203E,0180,09F0,0000,0001 :2078
U 106F, 0001,203E,0180,09F8,0000,0001 :2079
:2080

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```

Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3,RETURN1
: THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
=0
SHQL16: CALL,J/SHQL8
J/SHQL8
SHQL8: Q-Q.LEFT,SI/7
SHQL7: Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7,RETURN1
: THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
=0000
WRRARB: R[0]_Q,RETURN1
R[1]_Q,RETURN1
R[2]_Q,RETURN1
R[3]_Q,RETURN1
R[4]_Q,RETURN1
R[5]_Q,RETURN1
R[6]_Q,RETURN1
R[7]_Q,RETURN1
R[8]_Q,RETURN1
R[9]_Q,RETURN1
R[0A]_Q,RETURN1
R[0B]_Q,RETURN1
R[0C]_Q,RETURN1
R[0D]_Q,RETURN1
R[0E]_Q,RETURN1
R[0F]_Q,RETURN1
: THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
=0000
WRRRC: RC[0]_Q,RETURN1
RC[1]_Q,RETURN1
RC[2]_Q,RETURN1
RC[3]_Q,RETURN1
RC[4]_Q,RETURN1
RC[5]_Q,RETURN1
RC[6]_Q,RETURN1
RC[7]_Q,RETURN1
RC[8]_Q,RETURN1
RC[9]_Q,RETURN1
RC[0A]_Q,RETURN1
RC[0B]_Q,RETURN1
RC[0C]_Q,RETURN1
RC[0D]_Q,RETURN1
RC[0E]_Q,RETURN1
RC[0F]_Q,RETURN1
: THESE ARE USED TO READ THE RA AND RB SCRATCH PADS

```

```

:2081
:2082
U 1070, 0000,003E,0180,0A00,0000,0001 :2083
U 1071, 0000,003E,0180,0A08,0000,0001 :2084
U 1072, 0000,003E,0180,0A10,0000,0001 :2085
U 1073, 0000,003E,0180,0A18,0000,0001 :2086
U 1074, 0000,003E,0180,0A20,0000,0001 :2087
U 1075, 0000,003E,0180,0A28,0000,0001 :2088
U 1076, 0000,003E,0180,0A30,0000,0001 :2089
U 1077, 0000,003E,0180,0A38,0000,0001 :2090
U 1078, 0000,003E,0180,0A40,0000,0001 :2091
U 1079, 0000,003E,0180,0A48,0000,0001 :2092
U 107A, 0000,003E,0180,0A50,0000,0001 :2093
U 107B, 0000,003E,0180,0A58,0000,0001 :2094
U 107C, 0000,003E,0180,0A60,0000,0001 :2095
U 107D, 0000,003E,0180,0A68,0000,0001 :2096
U 107E, 0000,003E,0180,0A70,0000,0001 :2097
U 107F, 0000,003E,0180,0A78,0000,0001 :2098
:2099
:2100
U 1080, 0000,003E,0180,0900,0000,0001 :2101
U 1081, 0000,003E,0180,0908,0000,0001 :2102
U 1082, 0000,003E,0180,0910,0000,0001 :2103
U 1083, 0000,003E,0180,0918,0000,0001 :2104
U 1084, 0000,003E,0180,0920,0000,0001 :2105
U 1085, 0000,003E,0180,0928,0000,0001 :2106
U 1086, 0000,003E,0180,0930,0000,0001 :2107
U 1087, 0000,003E,0180,0938,0000,0001 :2108
U 1088, 0000,003E,0180,0940,0000,0001 :2109
U 1089, 0000,003E,0180,0948,0000,0001 :2110
U 108A, 0000,003E,0180,0950,0000,0001 :2111
U 108B, 0000,003E,0180,0958,0000,0001 :2112
U 108C, 0000,003E,0180,0960,0000,0001 :2113
U 108D, 0000,003E,0180,0968,0000,0001 :2114
U 108E, 0000,003E,0180,0970,0000,0001 :2115
U 108F, 0000,003E,0180,0978,0000,0001 :2116
:2117
:2118
:2119
U 1050, 0F00,003D,0180,0800,0000,1213 :2120
U 1051, 0000,003C,0180,0800,0000,1052 :2121
:2122
U 1052, 0000,193D,0180,0800,0000,1030 :2123
U 1053, 0819,0014,0580,0800,0010,1226 :2124
U 1226, 0000,013C,0180,0800,0000,1058 :2125
U 1058, 0000,003C,0180,0800,0000,1052 :2126
U 1059, 0000,003E,0180,0800,0000,0001 :2127
:2128
:2129
:2130
U 105C, 0F00,003D,0180,0800,0000,1213 :2131
U 105D, 0000,003C,0180,0800,0000,1098 :2132
:2133
U 1098, 0000,193D,0180,0800,0000,1060 :2134
U 1099, 0819,0014,0580,0800,0010,1227 :2135

```

```

: INTO LA AND LB.
=0000
LTCHAB: LAB_R[0],RETURN1
LAB_R[1],RETURN1
LAB_R[2],RETURN1
LAB_R[3],RETURN1
LAB_R[4],RETURN1
LAB_R[5],RETURN1
LAB_R[6],RETURN1
LAB_R[7],RETURN1
LAB_R[8],RETURN1
LAB_R[9],RETURN1
LAB_R[0A],RETURN1
LAB_R[0B],RETURN1
LAB_R[0C],RETURN1
LAB_R[0D],RETURN1
LAB_R[0E],RETURN1
LAB_R[0F],RETURN1
: THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
=0000
LTCHRC: LC_RC[0],RETURN1
LC_RC[1],RETURN1
LC_RC[2],RETURN1
LC_RC[3],RETURN1
LC_RC[4],RETURN1
LC_RC[5],RETURN1
LC_RC[6],RETURN1
LC_RC[7],RETURN1
LC_RC[8],RETURN1
LC_RC[9],RETURN1
LC_RC[0A],RETURN1
LC_RC[0B],RETURN1
LC_RC[0C],RETURN1
LC_RC[0D],RETURN1
LC_RC[0E],RETURN1
LC_RC[0F],RETURN1
: THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
: CONTENTS OF Q.
=0
RARB.Q: D 0,CALL,J/DC.NF
NOP
=0
RARB.QA: CALL,D3-0?,J/WRRARB
D_D+K[.1],CLK.UBCC
Z?
J/RARB.QA
RETURN1
: THIS ROUTINE IS USED TO FILL ALL RC WITH THE
: CONTENTS OF Q.
=0
RC.Q: D 0,CALL,J/DC.NF
NOP
=0
RC.QA: CALL,D3-0?,J/WRRARB
D_D+K[.1],CLK.UBCC

```

ZZ-ESKAH-V132 Subroutines
ESKAH23.MCR

MICRO2 1M(01)

16-DEC-82 10:57:29

E 1

SEQ 0206
Page 5

U 1227.	0000,013C,0180,0800,0000,109A	:2136		Z?
U 109A.	0000,003C,0180,0800,0000,1098	:2137	=0	J/RC.QA
U 109B.	0000,003E,0180,0800,0000,0001	:2138		RETURN1

ZZ-ESKAH-V132 Subroutines
ESKAH23.MCR
MICRO2 1M(01)
16-DEC-82 10:57:29
E 1
SEQ 0206
Page 5
U 1227. 0000,013C,0180,0800,0000,109A :2136
U 109A. 0000,003C,0180,0800,0000,1098 :2137
U 109B. 0000,003E,0180,0800,0000,0001 :2138
=0 J/RC.QA
RETURN1

```

:2139
:2140
:2141
:2142
:2143
:2144
:2145
:2146
:2147
:2148
:2149
:2150
:2151
:2152
:2153
:2154
:2155
:2156
:2157
:2158
:2159
:2160
:2161
:2162
U 109C, 0000,003D,0180,0800,0000,10B2
U 109D, 0018,0038,0980,09F8,0000,1228
U 1228, 0F00,003C,0180,0800,0000,10A8
U 10A8, 0000,003D,0180,0800,0000,101F
U 10A9, 0018,0038,C180,0800,0000,1229
U 1229, 0100,003C,0380,0800,0000,10AC
U 10AC, 0000,003D,0180,0800,0000,101F
U 10AD, 0001,003C,0180,0AA0,0000,10B0
U 10B0, 0F00,003D,0180,0800,0000,101B
U 10B1, 0001,003C,0180,0AA8,0000,122A
U 122A, 0F00,003C,0180,0800,0000,122B
U 122B, 0018,0038,C180,0800,0000,122C
U 122C, 0500,003C,0380,0800,0000,122D
U 122D, 0001,003C,0180,0A98,0000,10B4
U 10B4, 0000,003D,0180,0800,0000,111C
U 10B5, 0800,003C,0180,0A18,0000,122E
U 122E, 0001,003C,0180,0A88,0082,122F
U 122F, 0000,003C,C180,0800,0004,7230

:2181
:2182
:2183
:2184
U 1230, 0018,0038,1DC0,09E8,0000,1231
U 1231, 081C,2034,0180,0A20,0000,1232
U 1232, 0001,003C,0180,09F0,0000,1233
U 1233, 001D,2000,0180,0800,0010,1234
U 1234, 0000,013C,0180,0800,0000,10B8
U 10B8, 0000,003D,0180,0800,0000,111E
U 10B9, 0800,0028,0180,0A18,0000,1235

:2191
:2192
:2193
U 1235, 0001,003C,0180,0800,0082,1236

```

```

.PAGE "TEST 5E SC AND KMX/SC TEST"
*****
++
TEST 5E SC AND KMX/SC TEST

TEST DESCRIPTION
THIS IS A TEST OF THE SMX/ALU INPUTS, THE SC REGISTER AND
THE SC INPUTS TO THE KMX.
THE DATA PATTERNS USED ARE GENERATED BY FLOATING A
1 THROUGH 0'S AND A 0 THROUGH 1'S.

LOGIC DESCRIPTION
THE SC REGIATER <09:00> IS ON THE DDP MODULE.
THE KMX/SC BIT<9:8> ARE ON DDP, BITS <07:00> ARE ON DCP.
THE CONTROL SIGNALS FOR THE SMX AND SC REGISTER ARE GENERATED ON DDP.
THE KMX SELECT SIGNALS ARE GENERATED ON DCP.

ERROR DESCRIPTION
EXPECTED DATA
GOT DATA

--
*****
=0
SCTST: NEWTST
RC[0F]_K[.2]
D 0 ; GENERATE A MASK FOR
; CALCULATING THE EXPECTED RESULT.
=0 CALL,J/DCF
ALU_K[.FFFF]
D D.LEFT2,SI/7
=0 CALL,J/DCF
R[4] D ; R[4]=000003FF
=0 D 0,CALL,J/DCF
R[5]_D ; SET UP A COUNTER, R[5]=B
D 0 ; SET UP THE INITIAL DATA PATTERN
A[U_K[.FFFF]
D D.LEFT,SI/7
R[3] D ; R[3]=1
=0 ERLOOP
SCA: D R[3] ; SET UP THE OPERAND
A[U_D,SMX/ALU,SCK/LOAD,R[1] ALU ; LOAD SC
KMX7.FFFF,EBMX/KMX,EALU/B,SMX/EALU ; THIS INSTRUCTION
; INSURES THAT THE SC IS NOT
; CLOCKED WHEN IT SHOULDN'T
; BE CLOCKED. IT SHOULD
; HAVE NO EFFECT.
KMX/SC,BMX/KMX,ALU/B,Q ALU,RC[0D] ALU ; READ THE SC.
LAB R[4],ALU_LA[AND]D,D_ALU ; CALCULATE EXPECTED RESULT.
RC[0E] D
ALU_Q-B,CLK.UBCC ; RESULT CORRECT?
Z?
=0 ERROR1 ; REPORT THE ERROR.
LAB_R[3],ALU_NOT.LA,D_ALU ; GENERATE THE COMPLEMENT
; DATA PATTERN.
ALU_D,SMX/ALU,SCK/LOAD ; LOAD IT INTO THE SC.

```



```

KMX/ZERO,EBMX/KMX,EALU/B,SMX/EALU ; THIS INSTRUCTION SHOULD HAVE
; NO EFFECT.
KMX/SC,BMX/KMX,ALU/B,Q,ALU,RC[OD] ALU ; READ THE SC
LAB R[4],ALU_LA[AND]D,D,ALU ; CALCULATE THE EXPECTED RESULT.
RC[OE] D
ALU_Q-D,CLK.UBCC ; CHECK THE RESULT.
Z?
ERROR1 ; REPORT THE ERROR.
LAB_R[3] ; GENERATE NEXT PATTERN
ALU_LA,SHF/ALU.DT,DT/WORD,R[3] SHF
LAB_R[5] ; TRIED ALL PATTERNS?
R[5]_LA-K[.1],CLK.UBCC
Z?
J/SCA ; IF NOT CONTINUE TEST.
NOP ; ELSE DONE.

```

```

:2209
:2210
:2211
:2212
:2213
:2214
:2215
:2216
:2217
:2218
:2219
:2220
:2221
:2222
:2223
:2224
:2225
:2226
:2227
:2228
:2229
:2230
:2231
:2232
:2233
:2234
:2235
:2236
:2237
:2238
:2239
:2240
:2241
:2242
:2243
:2244
:2245
:2246
:2247
:2248
:2249
:2250
:2251
:2252
:2253
:2254
:2255
U 10C2, 0000,003D,0180,0800,0000,10B2
U 10C3, 0018,0038,0580,09F8,0000,10C8
U 10C8, 0000,003D,0180,0800,0000,111C
U 10C9, 0018,0038,1980,0800,0082,1240
U 1240, 0000,0C3C,0180,0800,0000,1003
U 1003, 0000,003C,0180,0800,0000,1241
U 1007, 0003,003D,0180,09F0,0000,111E
U 1241, 0000,123C,0180,0800,0000,100D
U 100D, 0000,003C,0180,0800,0000,1242
U 100F, 0018,0039,0580,09F0,0000,111E
U 1242, 0000,143C,0180,0800,0000,1043
U 1043, 0000,003C,0180,0800,0000,1243
U 1047, 0018,0039,0980,09F0,0000,111E
U 1243, 0000,143C,0180,0800,0000,1055
U 1055, 0000,003C,0180,0800,0000,1244
U 1057, 0018,0039,0D80,09F0,0000,111E
U 1244, 0000,143C,0180,0800,0000,109E
U 109E, 0000,003C,0180,0800,0000,1245
U 109F, 0018,0039,1180,09F0,0000,111E
U 1245, 0000,003C,0180,0800,0000,10CA

```

```

.PAGE 'TEST 5F SC BEN TEST A'
*****
++
TEST 5F SC BEN TEST A

TEST DESCRIPTION
  THIS IS A TEST OF:
    BEN/OC BIT 2
    BEN/12 BIT 1
    BEN/14 BIT 2
    BEN/14 BIT 1
    BEN/14 BIT 0
  WITH THE SC=0.

LOGIC DESCRIPTION

ERROR DESCRIPTION:
  ERROR CODE:
    0 - BEN/OC BIT 2 FAILED
    1 - BEN/12 BIT 1 FAILED
    2 - BEN/14 BIT 2 FAILED
    3 - BEN/14 BIT 1 FAILED
    4 - BEN/14 BIT 0 FAILED
  --
*****
=0
SCB: NEWTST
      RC[OF]_K[.1]
=0   ERLOOP
      ALU_0(K),SC_ALU      ; SET UP SC=0.
      BEN7MUL              ; BEN SC.NE.0
=011 J/SCB1
      ERROR1,RC[OE]_0      ; REPORT FAILURE
SCB1: BEN/EALU             ; BEN/SC.NE.0
=1101 J/SCB15
      ERROR1,RC[OE]_K[.1]
SCB15: SC?                 ; BEN SC<9:8>.NE.0
=011 J/SCB2
      ERROR1,RC[OE]_K[.2]
SCB2: SC?                 ; BEN SC.GT.0
=101 J/SCB3
      ERROR1,RC[OE]_K[.3]
SCB3: SC?                 ; BEN SC<9:5>.NE.0
=110 J/SCB4
      ERROR1,RC[OE]_K[.4]
SCB4: NOP

```

```

:2256
:2257
:2258
:2259
:2260
:2261
:2262
:2263
:2264
:2265
:2266
:2267
:2268
:2269
:2270
:2271
:2272
:2273
:2274
:2275
:2276
:2277
:2278
:2279
:2280
:2281
:2282
:2283
:2284
:2285
:2286
:2287
:2288
:2289
:2290
:2291
:2292
:2293
:2294
U 10C4, 0000,003D,0180,0800,0000,10B2
U 10C6, 0018,0038,F580,0AA8,0000,1246
U 1246, 0018,0038,0580,0AC8,0000,1247
U 1247, 0018,0038,0580,09F8,0000,10CC
U 10CC, 0000,003D,0180,0800,0000,111C
U 10CD, 0800,003C,0180,0A48,0082,1248
U 1248, 0003,123C,0180,09E8,0000,104D
U 104D, 0001,003D,0180,09F0,0000,111E
U 104F, 0018,0038,0580,09E8,0000,1249
U 1249, 0000,0C3C,0180,0A28,0000,105B
U 105B, 0001,003D,0180,09F0,0000,111E
U 105F, 0018,0000,0580,0AA8,0010,124A
U 124A, 0000,013C,0180,0A48,0000,10D0
U 10D0, 000C,0014,0180,0AC8,0000,10CD
U 10D1, 0000,003C,0180,0800,0000,10D2

```

```

.PAGE 'TEST 60 SC BEN TEST B'
*****
**
TEST 60 SC BEN TEST B
TEST DESCRIPTION
THIS IS A TEST OF BEN/SC.NE.0
BEN 0C BIT 2
BEN 12 BIT 1
WITH SC NOT ZERO. A 1 IS FLOATED
ACROSS 0'S IN THE SC.
LOGIC DESCRIPTION
ERROR DESCRIPTION
DATA PATTERN IN SC
ERROR CODE:
1 - BEN 0C BIT 2 FAILED (BEN/MUL)
0 - BEN 12 BIT 1 FAILED (BEN/EALU)
--
*****
=0
SCC: NEWTST
R[5]_K[A] ; SET UP A COUNTER
R[9]_K[1] ; INITIALIZE THE DATA PATTERN
R[0F]_K[1]
=0 ERLOOP
SCC1: SC R[9],D R[9] ; SET UP SC.
BEN/EALU,R[0D]_0 ; TEST INSTRUCTION
=1101 R[0E]_D,ERROR1
R[0D]_K[1]
LAB R[5],BEN/MUL ; BEN SC.NE.0
=011 R[0E]_D,ERROR1
R[5]_LA-K[1],CLK.UBCC ; FINISHED TEST?
Z?,LAB R[9]
=0 ALU_LA[A+B]LB,R[9]_ALU,J/SCC1 ; IF NOT GENERATE NEXT PATTERN
; AND CONTINUE TEST
NOP

```

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J 1

```

:2295
:2296
:2297
:2298
:2299
:2300
:2301
:2302
:2303
:2304
:2305
:2306
:2307
:2308
:2309
:2310
:2311
:2312
:2313
:2314
:2315
:2316
:2317
:2318
:2319
:2320
:2321
:2322
:2323
:2324
:2325
:2326
:2327
:2328
:2329
:2330
:2331
:2332
:2333
:2334
:2335
:2336
:2337
:2338
:2339
:2340
:2341
:2342
:2343
:2344
:2345
:2346
:2347
:2348
:2349
U 10D2, 0000,003D,0180,0800,0000,10B2
U 10D3, 0018,0038,0580,09F8,0000,124B
U 124B, 0F00,003C,0180,0800,0000,10D4
U 10D4, 0000,003D,0180,0800,0000,101C
U 10D5, 0100,003C,0180,0800,0000,10D8
U 10D8, 0000,003D,0180,0800,0000,1010
U 10D9, 0001,003C,0180,0AC0,0000,10DA
U 10DA, 0F00,003D,0180,0800,0000,1018
U 10DB, 0100,003C,0180,0800,0000,10E0
U 10E0, 0000,003D,0180,0800,0000,1010
U 10E1, 0001,003C,0180,0AC8,0000,10E2
U 10E2, 0F00,003D,0180,0800,0000,101F
U 10E3, 0018,0038,0180,0800,0000,124C
U 124C, 0500,003C,0380,0800,0000,10E8
U 10E8, 0500,003D,0180,0800,0000,1010
U 10E9, 0001,003C,0180,0AD0,0000,10EA
U 10EA, 0F00,003D,0180,0800,0000,101A
U 10EB, 0001,003C,0180,0AA8,0000,124D
U 124D, 0018,0038,0580,0AA0,0000,10F0
U 10F0, 0000,003D,0180,0800,0000,111C
U 10F1, 0800,003C,0180,0A20,0000,124E
U 124E, 0001,003C,0180,0A40,0082,124F
U 124F, 001C,2034,0180,0800,0010,1250
U 1250, 0000,013C,0180,0800,0000,10F2
U 10F2, 0018,1438,0580,09E8,0000,10B3
U 10F3, 0003,143C,0180,09E8,0000,10AB
U 10AB, 0000,003C,0180,0800,0000,1251
U 10AF, 0001,003D,0180,09F0,0000,111E
U 10B3, 0001,003D,0180,09F0,0000,111E

```

```

.PAGE "TEST 61 SC BEN TEST C"
*****
++
TEST 61 SC BEN TEST C

TEST DESCRIPTION
THIS IS A TEST OF BEN/14 USING DATA PATTERNS
GENERATED BY FLOATING A 1 THROUGH A FIELD
OF 20'S.

LOGIC DESCRIPTION

ERROR DESCRIPTION
DATA PATTERN IN SC
ERROR CODE:
0 - SC<9:8>.NE.0 FAILED TO BE DEASSERTED
1 - SC<9:8>.NE.0 FAILED TO BE ASSERTED
2 - SC.GT.0 FAILED TO BE DEASSERTED
3 - SC.GT.0 FAILED TO BE ASSERTED
4 - SC<9:5>.NE.0 FAILED TO BE DEASSERTED
5 - SC<9:5>.NE.0 FAILED TO BE ASSERTED
--
*****
=0
SCD: NEWTST
RC[0F]_K[.1]
D 0 ; GENERATE CONSTANTS
CALL,J/DCC ; NEEDED TO ESTABLISH
D D.LEFT2,SI/ZERO ; WHAT RESULT A PATTERN WILL
CALL,J/DC0 ; HAVE ON THE BEN.
R[8] D ; R8=300 (HEX)
D 0,CALL,J/DC8
D D.LEFT2,SI/ZERO
CALL,J/DC0 ; R9=200 (HEX)
R[9] D
D 0,CALL,J/DCF
A[U_K[FFFF]]
D D.LEFT,SI/7
D D.LEFT,SI/ZERO,CALL,J/DC0 ; RA=3F0 (HEX)
R[0A] D ; GENERATE A COUNTER
D 0,CALL,J/DCA ; R[5]=0A
R[5] D ; INITIALIZE THE DATA
R[4]_K[.1]
ERLOOP
SCD1: D R[4]
A[U D,SC ALU,LAB_R[8] ; SET UP THE SC
ALU_LA[AND]D,CLK_UBCC ; TEST SC<9:8>
Z?
SC?,J/SCD3,RC[0D]_K[.1] ; TEST INSTRUCTIONS
SC?,RC[0D]_0
J/SCD4
RC[0E]_D,ERROR1
=011
=011
SCD3: RC[0E]_D,ERROR1

```


U 10B7, 0000,003C,0180,0800,0000,1251 :2350
U 1251, 0000,003C,0180,0A48,0000,1252 :2351
U 1252, 001C,2034,0180,0800,0010,1253 :2352
U 1253, 0000,013C,0180,0800,0000,10F8 :2353
U 10F8, 0018,1438,0D80,09E8,0000,10BD :2354
U 10F9, 0018,1438,0980,09E8,0000,10C5 :2355
U 10BD, 0000,003C,0180,0800,0000,1254 :2356
U 10BF, 0001,003D,0180,09F0,0000,111E :2357
U 10C5, 0001,003D,0180,09F0,0000,111E :2358
U 10C7, 0000,003C,0180,0800,0000,1254 :2359
U 1254, 0000,003C,0180,0A50,0000,1255 :2360
U 1255, 001C,2034,0180,0800,0010,1256 :2361
U 1256, 0000,013C,0180,0800,0000,10FA :2362
U 10FA, 001B,1410,1180,09E8,0000,10D6 :2363
U 10FB, 0018,1438,1180,09E8,0000,10CE :2364
U 10CE, 0000,003C,0180,0800,0000,10D7 :2365
U 10CF, 0001,003D,0180,09F0,0000,111E :2366
U 10D6, 0001,003D,0180,09F0,0000,111E :2367
U 10D7, 0000,003C,0180,0A28,0000,1257 :2368
U 1257, 0018,0000,0580,0AA8,0010,1258 :2369
U 1258, 0000,013C,0180,0A20,0000,110A :2370
U 110A, 000C,0014,0180,0AA0,0000,10F1 :2371
U 110B, 0000,003C,0180,0800,0000,1110 :2372

SCD4: NOP
LAB_R[9]
ALU_LA[AND]D,CLK.UBCC ; TEST SC.GT.0
Z?
=0 SC?,J/SCD5,RC[OD]_K[.3] ; TEST INSTRUCTION
SC?,J/SCD6,RC[OD]_K[.2]
=101
SCD5: J/SCD7
RC[OE]_D,ERROR1
=101
SCD6: RC[OE]_D,ERROR1
NOP
SCD7: LAB_R[0A]
ALU_LA[AND]D,CLK.UBCC ; TEST SC<9:5>
Z?
=0 SC?,J/SCD10,RC[OD]_ALU,ALU_0+K[.4]+1
SC?,RC[OD]_K[.4]
=110 J/SCD11
RC[OE]_D,ERROR1
=110
SCD10: RC[OE]_D,ERROR1
SCD11: LAB_R[5]
R[5] LA-K[.1],CLK.UBCC ; USED ALL PATTERNS?
Z?,LAB_R[4] ; IF NOT THEN GENERATE
=0 ALU_LA[A+B]LB,R[4]_ALU,J/SCD1 ; NEXT PATTERN AND CONTINUE.
NOP

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U 1110, 0000,003D,0180,0800,0000,1082
U 1111, 0018,0038,0980,09F8,0000,1259
U 1259, 0F18,0038,C180,0800,0000,1112
U 1112, 0500,003D,0380,0800,0000,101F
U 1113, 0001,003C,01F8,0AA8,0000,125A
U 125A, 0000,003C,0380,0800,0000,1118
U 1118, 0000,003D,0180,0800,0000,111C
U 1119, 0000,003C,0180,0A28,0082,125B
U 125B, 0001,2028,0180,09F0,0000,125C
U 125C, 0001,2010,0180,0800,0010,125D
U 125D, 0000,013C,0180,0800,0000,111A
U 111A, 0000,0039,0180,09E8,0000,111E
U 111B, 0000,003C,0180,0A28,0010,125E
U 125E, 0000,013C,0180,0800,0000,1120
U 1120, 0018,0000,0580,0AA8,0000,1119
U 1121, 0000,003C,0180,0800,0000,1122

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.PAGE 'TEST 62 MASK TEST'
*****
++
TEST 62 MASK TEST

TEST DESCRIPTION
A COUNT PATTERN IS RUN THROUGH SC<4:0> AND THE
RESULTANT MASK IS READ THROUGH THE BMX AND CHECKED FOR EACH
SC PATTERN.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED MASK
GOT MASK

--
*****
=0
MSKST: NEWTST
RC[0F] K[.2]
D_0,ALU,K[.FFFF] ; SET UP A COUNTER.
=0 D-D.LEFT,SI/7,CALL,J/DCF
R[5] D,0 0
Q Q.RIGHT,SI/7
=0 ERLOOP
MSK1: SC R[5] ; SET UP SC
ALD NOT.Q,RC[0E],ALU ; COMPUTE EXPECTED RESULT.
; TEST INSTRUCTION:
BMX/MASK,AMX/Q,AMX/RAMX,ALU/A+B+1,CLK.UBCC
Z?
=0 BMX/MASK,ALU/B,RC[0D],ALU,ERROR1
Q Q.RIGHT,SI/ZERO,ALU_R[5],CLK.UBCC ; FINISHED TEST?
Z?
=0 R[5]_LA-K[.1],J/MSK1 ; IF NOT CONTINUE WITH NEXT PATTERN
NOP

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U 1122. 0000.003D.0180.0800.0000.10B2
U 1123. 0018.0038.0980.09F8.0000.1124
U 1124. 0818.0039.0180.0AA8.0000.1010
U 1125. 0001.003C.0180.0A98.0000.125F
U 125F. 0018.0038.0580.0AA0.0000.1260
U 1260. 0018.0038.4980.0AB0.0000.1126
U 1126. 0000.003D.0180.0800.0000.111C
U 1127. 0000.003C.0180.0A18.0083.1261
U 1261. 0000.003C.01C0.0A20.0000.1262
U 1262. 001C.0034.01C0.0A30.0000.1263
U 1263. 0001.203C.0180.09F0.0000.1264
U 1264. 0818.0038.1D80.09E8.0000.1265
U 1265. 001D.2000.0180.0800.0010.1266
U 1266. 0000.013C.0180.0800.0000.1128
U 1128. 0000.003D.0180.0800.0000.111E
U 1129. 0000.0028.0180.0A18.0083.1267
U 1267. 0000.003C.01C0.0A20.0000.1268
U 1268. 001C.0024.01C0.0A30.0000.1269
U 1269. 0001.203C.0180.09F0.0000.126A
U 126A. 0818.0038.1D80.09E8.0000.126B
U 126B. 001D.2000.0180.0800.0010.126C
U 126C. 0000.013C.0180.0800.0000.112A
U 112A. 0000.003D.0180.0800.0000.111E
U 112B. 0000.003C.0180.0A28.0000.126D
U 126D. 0018.0000.0580.0AA8.0010.126E
U 126E. 0000.013C.0180.0800.0000.112C
U 112C. 0000.003C.0180.0A20.0000.126F
U 112D. 0000.003C.0180.0800.0000.1272
U 126F. 0020.003C.0100.0AA0.0000.1270
U 1270. 0000.003C.0180.0A18.0000.1271
U 1271. 0020.003C.0100.0A98.0000.1127
U 1272. 0000.003C.0180.0800.0000.112E

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.PAGE "TEST 63 SMX/ALU.EXP TEST"
*****
++
TEST 63 SMX/ALU/EXP TEST

TEST DESCRIPTION
THIS IS A TEST OF THE SMX/ALU.EXP INPUTS. THE EXPONENT
IS IN BIT POSITION <14:07>. A ONE IS FLOATED ACROSS
0'S AND A 0 IS FLOATED ACROSS 1'S TO GENERATE
THE TEST PATTERNS USED HERE.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED DATA
GOT DATA

--
*****
=0
SMXP: NEWTST
RC[0F] KC[.2]
D KC[.8],R[5]_KC[.8],CALL,J/DCO ; SET UP A COUNTER
R[3]_D ; AND THE INITIAL DATA PATTERN
R[4]_KC[.1]
R[6]_KC[.FF]
=0
ERLOOP
SMXP1: ALU R[3],SC_ALU(EXP) ; TEST INSTRUCTION
Q R[4] ; COMPUTE EXPECTED DATA.
LAB R[6],ALU_LA[AND]Q,Q_ALU
RC[0E] Q
D SC,R[0D]_ALU ; GET THE ACTUAL RESULT.
ALU_Q-D,CLK_UBCC ; IS IT CORRECT?
Z?
=0
ERROR1
LAB R[3],AMX/LA,ALU/NOTA,SC_ALU(EXP) ; NOW TEST
Q R[4] ; THE COMPLEMENT DATA PATTERN
LAB R[6],ALU_LA[ANDNOT]Q,Q_ALU
RC[0E] Q
D SC,R[0D]_ALU ; GET THE RESULT.
ALU_Q-D,CLK_UBCC ; IS IT CORRECT?
Z?
=0
ERROR1
LAB R[5]
R[5]_LA-KC[.1],CLK_UBCC ; TESTING COMPLETE?
Z?
=0
LAB R[4],J/SMXP2 ; IF NOT SHIFT DATA PATTERN
J/SMXP3
SMXP2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF
LAB R[3]
ALU_LA,SHF/LEFT,SI/2,R[3]_SHF,J/SMXP1
SMXP3: NOP

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U 112E, 0000,003D,0180,0800,0000,10B2
U 112F, 0018,0038,5580,0AC0,0000,1273
U 1273, 0018,0038,8D80,0AD0,0000,1274
U 1274, 0F00,003C,0180,0800,0000,1275
U 1275, 0000,003C,01F8,0800,0000,1276
U 1276, 0000,003C,03A8,0800,0000,1277
U 1277, 0001,003C,0180,0A98,0000,1278
U 1278, 0001,203C,0180,0AA0,0000,1130
U 1130, 0000,003D,0180,0800,0000,1280
U 1131, 0001,003C,0180,0AAB,0000,1279
U 1279, 0001,203C,0180,0AB0,0000,1132
U 1132, 0F00,003D,0180,0800,0000,1014
U 1133, 0100,003C,0180,0800,0000,127A
U 127A, 0100,003C,0180,0800,0000,127B
U 127B, 0001,003C,0180,0AB8,0000,1134
U 1134, 0000,003D,0180,0800,0000,111C
U 1135, 0800,003C,0180,0A18,0000,127C
U 127C, 0000,003C,01C0,0A20,0000,127D
U 127D, 0000,003C,0180,0A50,0082,127E
U 127E, 0D00,003C,0180,0800,0000,127F
U 127F, 0001,003C,0180,0A90,0000,1280
U 1280, 0000,003C,01C0,0A28,0000,1281
U 1281, 0001,203C,0180,0A88,0000,1282
U 1282, 001D,2000,0180,0800,0010,1283
U 1283, 0000,013C,0180,0800,0000,1136
U 1136, 0800,003C,0180,0A40,0000,12A5
U 1137, 0000,003C,0180,0A18,0000,1284
U 1284, 0800,0028,0180,0A98,0000,1285
U 1285, 0000,003C,0180,0A20,0000,1286
U 1286, 0000,0028,01C0,0AA0,0000,1287
U 1287, 0000,003C,0180,0A50,0082,1288
U 1288, 0D00,003C,0180,0800,0000,1289

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.PAGE "TEST 64 DAL SHIFTER TEST"
*****
**
TEST 64 DAL SHIFTER TEST

TEST DESCRIPTION
THIS IS A TEST OF THE DAL SHIFTER CIRCUIT. ALL THE
DATA PATTERNS GENERATED BY SHIFTING A 1 THROUGH A FIELD
OF 0'S AND A 0 THROUGH A FIELD OF 1'S IS TRIED WITH EVERY
SHIFT COUNT POSSIBLE.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED D REGISTER RESULT
GOT RESULT
D REGISTER OPERAND
Q REGISTER OPERAND
SC VALUE USED IN SHIFT

--
*****
=0
DAL: NEWTST
      R[8]_K[.3F]          ; SET UP A COUNTER
      R[0A]_K[.1F]         ; INITIALIZE THE SHIFT COUNT
DAL1: D_0
      Q_0
      Q_Q.LEFT,SI/7
      R[3]_D
      R[4]_Q
=0    CALL J/DALSUT        ; SET UP FOR TEST OF THIS SC.
      R[5]_D
      R[6]_Q
=0    D_0,CALL J/DC4        ; SET UP A COUNTER
      D_D.LEFT2,SI/ZERO    ; R[7]=X40, TO KEEP
      D_D.LEFT2,SI/ZERO    ; TRACK OF HOW MANY
      R[7]_D               ; DATA PATTERNS HAVE BEEN TESTED.
=0    ERLOOP
DAL2: D_R[3]              ; SET UP THE OPERANDS.
      Q_R[4]
      SC_R[0A]            ; SET UP THE SHIFT COUNT
      D_DAL.SC            ; TEST INSTRUCTION
      R[2]_D
      Q_R[5]              ; GET THE EXPECTED RESULT
      R[1]_Q
      ALU_Q-D,CLK.UBCC     ; COMPARE THE EXPECTED RESULT
      Z?                  ; WITH THE ACTUAL RESULT
=0    D_R[8],J/DALERR      ; REPORT ERROR.
      LAB_R[3]            ; NOW TEST THE COMPLEMENT PATTERNS.
      AMX7LA,ALU/NOTA,D_ALU,R[3]_ALU ; LOAD OPERANDS.
      LAB_R[4]
      AMX7LA,ALU/NOTA,Q_ALU,R[4]_ALU
      SC_R[0A]            ; SET UP THE SHIFT COUNT
      D_DAL.SC            ; TEST INSTRUCTION.

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U 1289, 0001,003C,0180,0A90,0000,128A :2519
U 128A, 0000,0028,01C0,0A28,0000,128B :2520
U 128B, 0001,203C,0180,0A88,0000,128C :2521
U 128C, 001D,2000,0180,0800,0010,128D :2522
U 128D, 0000,013C,0180,0800,0000,1138 :2523
U 1138, 0800,003C,0180,0A40,0000,12A5 :2524
U 1139, 0000,003C,0180,0A18,0000,128E :2525
U 128E, 0800,0028,0180,0A98,0000,128F :2526
U 128F, 0000,003C,0180,0A20,0000,1290 :2527
U 1290, 0000,0028,01C0,0AA0,0000,1291 :2528
U 1291, 0500,003C,0000,0800,0000,1292 :2529
U 1292, 0001,003C,0180,0AC8,0000,1293 :2530
U 1293, 0800,003C,0180,0A18,0000,1294 :2531
U 1294, 0000,003C,0128,0A48,0000,1295 :2532
U 1295, 0000,003C,0180,0A98,0000,1296 :2533
U 1296, 0001,203C,0180,0AA0,0000,1297 :2534
U 1297, 0800,003C,0180,0A28,0000,1298 :2535
U 1298, 0000,003C,01C0,0A30,0000,1299 :2536
U 1299, 0500,003C,0000,0800,0000,129A :2537
U 129A, 0001,003C,0180,0AC8,0000,129B :2538
U 129B, 0800,003C,0180,0A28,0000,129C :2539
U 129C, 0000,003C,0128,0A48,0000,129D :2540
U 129D, 0000,003C,0180,0AA8,0000,129E :2541
U 129E, 0001,203C,0180,0AB0,0000,129F :2542
U 129F, 0000,003C,0180,0A38,0000,12A0 :2543
U 12A0, 0018,0000,0580,0AB8,0010,12A1 :2544
U 12A1, 0000,013C,0180,0800,0000,113A :2545
U 113A, 0000,003C,0180,0800,0000,1135 :2546
U 113B, 0000,003C,0180,0A50,0000,12A2 :2547
U 12A2, 0018,0000,0580,0AD0,0000,12A3 :2548
U 12A3, 0000,003C,0180,0A40,0010,12A4 :2549
U 12A4, 0000,013C,0180,0800,0000,113C :2550
U 113C, 0018,0000,0580,0AC0,0000,1274 :2551
U 113D, 0000,003C,0180,0800,0000,12B8 :2552
:2553
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:2561
U 12A5, 0F00,003C,0180,0800,0000,113E :2562
U 113E, 0000,003D,0180,0800,0000,1015 :2563
U 113F, 0001,003C,0180,09F8,0000,12A6 :2564
U 12A6, 0000,003C,0180,0A08,0000,12A7 :2565
U 12A7, 0000,003C,0180,09F0,0000,12A8 :2566
U 12A8, 0000,003C,0180,0A10,0000,12A9 :2567
U 12A9, 0000,003C,0180,09E8,0000,12AB :2568
U 12AB, 0000,003C,0180,0A18,0000,12AC :2569
U 12AC, 0000,003C,0180,09E0,0000,12AD :2570
U 12AD, 0000,003C,0180,0A20,0000,12AE :2571
U 12AE, 0000,003C,0180,09D8,0000,12AF :2572
U 12AF, 0818,0039,1D80,09D0,0000,111E :2573

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R[2] D ; SAVE THE RESULT
LAB R[5],AMX/LA,ALU/NOTA,Q ALU ; CALCULATE THE EXPECTED
R[1] Q ; RESULT.
ALU_Q-D,CLK.UBCC ; IS THE ACTUAL RESULT EQUAL
Z? ; TO THE EXPECTED RESULT?
=0 D R[8],J/DALERR ; REPORT ERROR
DAL3: LAB R[3] ; COMPUTE NEXT OPERANDS.
ALU_NOT,LA,R[3],ALU,D_ALU
LAB R[4]
ALU_NOT,LA,R[4],ALU,Q_ALU
D D.LEFT,S1/0 ; S1=Q31
R[9] D
D R[3]
LAB R[9],Q_Q.LEFT,S1/2 ; S1=D31
R[3] LA
R[4] Q
D R[5] ; COMPUTE NEXT EXPECTED
Q_R[6] ; RESULT.
D D.LEFT,S1/0
R[9] D
D R[5]
LAB R[9],Q_Q.LEFT,S1/2
R[5] LA
R[6] Q
LAB R[7]
R[7] LA-K[.1],CLK.UBCC ; SEE IF FINISHED TESTING
Z? ; THIS SHIFT COUNT.
=0 J/DAL2 ; IF NOT CONTINUE
LAB R[0A] ; DECREMENT THE SHIFT COUNT
R[0A] LA-K[.1]
ALU_R[8],CLK.UBCC ; SEE IF ALL SHIFT COUNTS
Z? ; HAVE BEEN TESTED.
=0 R[8] LA-K[.1],J/DAL1 ; IF NOT DECREMENT COUNTER, CONTINUE
J/DAL100 ; DONE!
; WHEN AN ERROR IS ENCOUNTERED THE CONTENTS OF THESE RC REGISTERS
; IS TYPED:
:2556 RC[0E] = EXPECTED RESULT (IN D)
:2557 RC[0D] = GOT RESULT (IN D)
:2558 RC[0C] = D OPERAND
:2559 RC[0B] = Q OPERAND
:2560 RC[0A] = SC VALUE USED IN SHIFT
:2561
DALERR: D 0
=0 CALL,J/DC5
RC[0F] D
LAB R[1]
RC[0E] LA
LAB R[2]
RC[0D] LA
LAB R[3]
RC[0C] LA
LAB R[4]
RC[0B] LA
D_SC,RC[0A],ALU,ERROR1

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:2574 : THIS ROUTINE IS CALLED TO SET UP THE EXPECTED RESULT
:2575 : FOR TO FIRST OPERANDS USED WITH EACH SHIFT COUNT. THE
:2576 : REMAINING RESULTS FOR THIS SHIFT COUNT ARE
:2577 : COMPUTED USING THIS INITIAL ONE BY SHIFTING IT LEFT
:2578 : EACH TIME THE OPERAND IS SHIFT LEFT TO PRODUCE THE NEXT
:2579 : TEST DATA PATTERN.
U 12B0, 0818,0038,7580,0800,0000,12B1 :2580 DALST: D_K[.20]
U 12B1, 0000,003C,0180,0A50,0082,12B2 :2581 SC_R[0A]
U 12B2, 001C,2014,0180,0800,0010,12B3 :2582 ALU_LACA+B]D,CLK.UBCC
U 12B3, 0000,013C,0180,0800,0000,1140 :2583 Z?
U 1140, 0000,003C,0180,0800,0000,12B4 :2584 =0 J/DALST1
U 1141, 0818,003A,05F8,0800,0000,0001 :2585 D_K[.1],Q_0,RETURN1
U 12B4, 001C,2034,0180,0800,0010,12B5 :2586 DALST1: ALU_LA[AND]D,CLK.UBCC
U 12B5, 0000,013C,0180,0800,0000,1142 :2587 Z?
U 1142, 0000,003C,0180,0800,0000,12B6 :2588 =0 J/DALST2
U 1143, 0F03,001E,01C0,0800,0000,0001 :2589 ALU_NOT.MASK,Q_ALU,D_0,RETURN1
U 12B6, 001C,2014,0180,0800,0082,12B7 :2590 DALST2: ALU_LACA+B]D,SC_ALU
U 12B7, 0803,001E,01F8,0800,0000,0001 :2591 ALU_NOT.MASK,D_ALU,Q_0,RETURN1
U 12B8, 0000,003C,0180,0800,0000,1144 :2592 DAL100: NOP

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:2593 .PAGE "TEST 65 EALU/A+1, EAMX/SC AND SMX/EALU TEST"
:2594 *****
:2595 ++
:2596 TEST 65 EALU/A+1, EAMX/SC AND SMX/EALU TEST
:2597
:2598 TEST DESCRIPTION
:2599 THIS IS A TEST OF THE SC INPUTS TO THE EAMX (THESE
:2600 ARE SELECTED BY DEFAULT UNLESS DOING MSC/LOAD.STATE)
:2601 THE EALU FUNCTION A+1 IS NOT TESTED COMPREHENSIVELY
:2602 HERE BUT IS MERELY USED TO CHANGE THE DATA WHICH
:2603 AFTER BEING INCREMENTED IS ROUTED THROUGH THE SMX
:2604 BACK INTO THE SC.
:2605
:2606 LOGIC DESCRIPTION
:2607
:2608 ERROR DESCRIPTION
:2609 EXPECTED DATA
:2610 GOT DATA
:2611
:2612 --
:2613 *****
:2614 =0
:2615 EXPA: NEWTST
:2616 R[5]=K[.2]
:2617 R[5]=K[.C] ; SET UP A COUNTER, R[5]=0C
:2618 D_K[.F]
:2619 =0 D-D.LEFT2,SI/7,CALL,J/DCF
:2620 R[6]=D ; R[6]=3FF, USED AS A MASK
:2621 R[4]=K[.1] ; INITIAL DATA PATTERN
:2622 =0 ERLOOP
:2623 EXPA1: ALU R[4],SC,ALU ; SET UP OPERAND
:2624 EALU/A+1,SC,EALU,ALU,LA+K[.1],Q,ALU ; TEST INSTRUCTION
:2625 LAB R[6] ; COMPUTE EXPECTED RESULT
:2626 ALU,LA[AND]Q,R[OE],ALU,Q,ALU
:2627 D SC,R[OD],ALU ; GET ACTUAL RESULT
:2628 A[U-Q-D,CLK,UBCC] ; IS IT CORRECT
:2629 Z?
:2630 =0 ERROR1 ; REPORT ERROR.
:2631 LAB R[4],AMX/LA,ALU/NOTA,SC,ALU ; NOW TEST COMPLEMENT PATTERN
:2632 EALU/A+1,SC,EALU,ALU,NOT,LA,Q,ALU ; TEST INSTRUCTION
:2633 LAB R[6],Q,Q+K[.1] ; COMPUTE EXPECTED RESULT
:2634 ALU,LA[AND]Q,Q,ALU,R[OE],ALU
:2635 D SC,R[OD],ALU ; GET ACTUAL RESULT
:2636 A[U-Q-D,CLK,UBCC] ; IS IT CORRECT
:2637 Z?
:2638 =0 ERROR1 ; REPORT ERROR
:2639 LAB R[5] ; SEE IF ALL PATTERNS HAVE
:2640 R[5]=LA-K[.1],CLK,UBCC ; TESTED.
:2641 Z?
:2642 =0 LAB R[4],J/EXPA2 ; IF NOT SHIFT DATA AND CONTINUE
:2643 J/EXPA3
:2644 EXPA2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4],SHF,J/EXPA1
:2645 EXPA3: NOP

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U 1144, 0000,003D,0180,0800,0000,10B2
U 1145, 0018,0038,0980,09F8,0000,12B9
U 12B9, 0018,0038,8580,0AA8,0000,12BA
U 12BA, 0818,0038,6180,0800,0000,1146
U 1146, 0100,003D,0380,0800,0000,101F
U 1147, 0001,003C,0180,0AB0,0000,12BB
U 12BB, 0018,0038,0580,0AA0,0000,1148
U 1148, 0000,003D,0180,0800,0000,111C
U 1149, 0000,003C,0180,0A20,0082,12BC
U 12BC, 0018,0014,05C0,0800,0080,D2BD
U 12BD, 0000,003C,0180,0A30,0000,12BE
U 12BE, 001C,0034,01C0,09F0,0000,12BF
U 12BF, 0818,0038,1D80,09E8,0000,12C0
U 12C0, 001D,2000,0180,0800,0010,12C1
U 12C1, 0000,013C,0180,0800,0000,114A
U 114A, 0000,003D,0180,0800,0000,111E
U 114B, 0000,0028,0180,0A20,0082,12C2
U 12C2, 0000,0028,01C0,0800,0080,D2C3
U 12C3, 0019,2014,05C0,0A30,0000,12C4
U 12C4, 001C,0034,01C0,09F0,0000,12C5
U 12C5, 0818,0038,1D80,09E8,0000,12C6
U 12C6, 001D,2000,0180,0800,0010,12C7
U 12C7, 0000,013C,0180,0800,0000,114C
U 114C, 0000,003D,0180,0800,0000,111E
U 114D, 0000,003C,0180,0A28,0000,12C8
U 12C8, 0018,0000,0580,0AA8,0010,12C9
U 12C9, 0000,013C,0180,0800,0000,114E
U 114E, 0000,003C,0180,0A20,0000,12CA
U 114F, 0000,003C,0180,0800,0000,12CB
U 12CA, 0020,003C,0100,0AA0,0000,1149
U 12CB, 0000,003C,0180,0800,0000,1150

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U 1150. 0000.003D.0180.0800.0000.10B2
U 1151. 0018.0038.0980.09F8.0000.12CC
U 12CC. 0018.0038.8580.0AA8.0000.12CD
U 12CD. 0818.0038.6180.0800.0000.1152
U 1152. 0100.003D.0380.0800.0000.101F
U 1153. 0001.003C.0180.0AB0.0000.12CE
U 12CE. 0018.0038.0580.0AA0.0000.1156
U 1156. 0000.003D.0180.0800.0000.111C
U 1157. 0000.003C.0180.0A20.0082.12CF
U 12CF. 0000.003C.01C0.0800.0080.12D0
U 12D0. 0000.003C.0180.0A30.0000.12D1
U 12D1. 001C.0034.01C0.09F0.0000.12D2
U 12D2. 0818.0038.1D80.09E8.0000.12D3
U 12D3. 001D.2000.0180.0800.0010.12D4
U 12D4. 0000.013C.0180.0800.0000.1158
U 1158. 0000.003D.0180.0800.0000.111E
U 1159. 0000.0028.0180.0A20.0082.12D5
U 12D5. 0000.0028.01C0.0800.0080.12D6
U 12D6. 0000.003C.0180.0A30.0000.12D7
U 12D7. 001C.0034.01C0.09F0.0000.12D8
U 12D8. 0818.0038.1D80.09E8.0000.12D9
U 12D9. 001D.2000.0180.0800.0010.12DA
U 12DA. 0000.013C.0180.0800.0000.115A
U 115A. 0000.003D.0180.0800.0000.111E
U 115B. 0000.003C.0180.0A28.0000.12DB
U 12DB. 0018.0000.0580.0AA8.0010.12DC
U 12DC. 0000.013C.0180.0800.0000.115C
U 115C. 0000.003C.0180.0A20.0000.12DD
U 115D. 0000.003C.0180.0800.0000.12DE
U 12DD. 0020.003C.0100.0AA0.0000.1157
U 12DE. 0000.003C.0180.0800.0000.115E

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.PAGE 'TEST 66 EALU/A TEST'
*****
++
TEST 66 EALU/A TEST
TEST DESCRIPTION
THIS IS A TEST OF THE EALU/A FUNCTION. A 1 IS
FLOATED ACROSS 0'S AND A 0 IS FLOATED ACROSS 1'S
TO GENERATE THE TEST DATA PATTERNS USED.
LOGIC DESCRIPTION
ERROR DESCRIPTION
EXPECTED DATA
GOT DATA
--
*****
=0
EXPB: NEWTST
RC[0F]_K[.2]
R[5]_K[.C] ; SET UP A COUNTER, R[5]=0C
D_K[.F] ; SET UP A MASK, R[6]=3FF
D-D.LEFT2,SI/7,CALL,J/DCF
R[6]_D
R[4]_K[.1] ; INITIALIZE THE DATA PATTERN.
ERLOOP
EXPB1: ALU[R[4],SC,ALU ; LOAD TEST PATTERN INTO SC.
EALU/A,SC,EALU,Q_LA ; TEST INSTRUCTION.
LAB R[6] ; COMPUTE THE EXPECTED RESULT.
ALU_LA[AND]Q,Q,ALU,RC[OE]_ALU
D SC,RC[OD]_ALO ; GET THE ACTUAL RESULT.
A[U_Q-D,CLK,UBCC ; IS IT CORRECT?
Z?
=0 ERROR1 ; REPORT ERROR.
LAB R[4],AMX/LA,ALU/NOTA,SC,ALU ; TEST COMPLEMENT PATTERN
EALU/A,SC,EALU,ALU_NOT.LA,Q_ALU ; TEST INSTRUCTION
LAB R[6] ; COMPUTE THE EXPECTED RESULT.
ALU_LA[AND]Q,Q,ALU,RC[OE]_ALU
D SC,RC[OD]_ALO ; GET THE ACTUAL RESULT.
A[U_Q-D,CLK,UBCC ; IS IT CORRECT.
Z?
=0 ERROR1 ; REPORT ERROR.
LAB R[5] ; HAVE ALL TEST PATTERNS
R[5]_LA-K[.1],CLK,UBCC ; BEEN TRIED.
Z?
=0 LAB R[4],J/EXPB2 ; IF NOT SHIFT DATA AND CONTINUE.
J/EXPB3
EXPB2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPB1
EXPB3: NOP

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U 115E. 0000,003D,0180,0800,0000,10B2
U 115F. 0018,0038,0980,09F8,0000,12DF
U 12DF. 0018,0038,8580,0AA8,0000,12E0
U 12E0. 0818,0038,6180,0800,0000,1160
U 1160. 0100,003D,0380,0800,0000,101F
U 1161. 0001,003C,0180,0AB0,0000,12E1
U 12E1. 0018,0038,0580,0AA0,0000,1162
U 1162. 0000,003D,0180,0800,0000,111C
U 1163. 0000,003C,01C0,0A20,0082,12E2
U 12E2. 0000,003C,1D80,0A30,0084,72E3
U 12E3. 001C,0034,01C0,09F0,0000,12E4
U 12E4. 0818,0038,1D80,09E8,0000,12E5
U 12E5. 001D,2000,0180,0800,0010,12E6
U 12E6. 0000,013C,0180,0800,0000,1164
U 1164. 0000,003D,0180,0800,0000,111E
U 1165. 0000,0028,01C0,0A20,0082,12E7
U 12E7. 0000,003C,1D80,0A30,0084,72E8
U 12E8. 001C,0034,01C0,09F0,0000,12E9
U 12E9. 0818,0038,1D80,09E8,0000,12EA
U 12EA. 001D,2000,0180,0800,0010,12EB
U 12EB. 0000,013C,0180,0800,0000,1166
U 1166. 0000,003D,0180,0800,0000,111E
U 1167. 0000,003C,0180,0A28,0000,12EC
U 12EC. 0018,0000,0580,0AA8,0010,12ED
U 12ED. 0000,013C,0180,0800,0000,1168
U 1168. 0000,003C,0180,0A20,0000,12EE
U 1169. 0000,003C,0180,0800,0000,12EF
U 12EE. 0020,003C,0100,0AA0,0000,1163
U 12EF. 0000,003C,0180,0800,0000,116A

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.PAGE 'TEST 67 EBMX/KMX AND EALU/B TEST'
*****
++
TEST 67 EBMX/KMX AND EALU/B TEST

TEST DESCRIPTION
THIS TEST TAKES A DATA PATTERN FROM THE SC, PASSES IT
THROUGH THE KMX, THEN THROUGH THE EBMX AND FINALLY
THROUGH THE EALU. DATA PATTERNS USED ARE THOSE GENERATED
BY FLOATING A 1 THROUGH 0'S AND A 0 THROUGH 1'S.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED DATA
GOT DATA

--
*****
=0
EXPC: NEWTST
      RC[0F],KC[2]
      R[5],KC[C] ; SET UP A COUNTER, R[5]=0C
      D,KC[F] ; SET UP A MASK, R[6]=3FF
=0 D-D,LEFT2,SI/7,CALL,J/DCF
      R[6],D
      R[4],KC[1] ; INITIALIZE THE TEST DATA PATTERN.
=0 ERLOOP
EXPC1: Q R[4],SC ALU ; SET UP THE OPERAND
      KMX/SC,EBMX/KMX,EALU/B,SC EALU,LAB R[6] ; TEST INSTRUCTION
      ALU,LA[AND]Q,RC[0E],ALU,Q,ALU ; COMPUTE EXPECTED RESULT
      D,SC,RC[0D],ALU ; GET ACTUAL RESULT
      A[U-Q-D,CLK,UBCC] ; IS IT CORRECT?
      Z?
=0 ERROR1 ; REPORT ERROR
      LAB R[4],AMX/LA,ALU/NOTA,SC ALU,Q,ALU ; USE COMPLEMENT PATTERN
      KMX/SC,EBMX/KMX,EALU/B,SC EALU,LAB R[6] ; TEST INSTRUCTION
      ALU,LA[AND]Q,RC[0E],ALU,Q,ALU ; COMPUTE EXPECTED RESULT
      D,SC,RC[0D],ALU ; GET ACTUAL RESULT.
      A[U-Q-D,CLK,UBCC] ; IS IT CORRECT?
      Z?
=0 ERROR1 ; REPORT ERROR
      LAB R[5] ; SEE IF ALL PATTERNS HAVE BEEN TESTED
      R[5],LA-KC[1],CLK,UBCC
      Z?
=0 LAB R[4],J/EXPC2 ; IF NOT SHIFT DATA AND CONTINUE
      J/EXPC3
EXPC2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4],SHF,J/EXPC1
EXPC3: NOP

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:2745 .PAGE 'TEST 68 FE AND SMX/FE TEST'
:2746 *****
:2747 **
:2748 TEST 68 FE AND SMX/FE TEST
:2749
:2750 TEST DESCRIPTION
:2751 THIS IS A TEST OF THE FE LOAD FUNCTION, THE FE REGISTER'S
:2752 DATA INTEGRITY AND THE SMX FE INPUTS. DATA IS GENERATED USING
:2753 A 1 IN 0'S AND A 0 IN 1'S.
:2754
:2755 LOGIC DESCRIPTION
:2756
:2757 ERROR DESCRIPTION
:2758 EXPECTED RESULT
:2759 GOT RESULT
:2760
:2761 --
:2762 *****
:2763 =0
:2764 EXPD: NEWTST
:2765 RC[0F] K[.2]
:2766 R[5] K[.C] ; SET UP A COUNTER, R[5]=0C
:2767 D_K[.F] ; SET UP A MASK, R[6]=3FF
:2768 =0 D-D.LEFT2,SI/7,CALL,J/DCF
:2769 R[6] D
:2770 R[4] K[.1] ; INITIALIZE TEST DATA PATTERN
:2771 =0 ERLOOP
:2772 EXPD1: Q R[4],SC ALU ; SET UP THE OPERAND
:2773 EALU/A,FER/LOAD,ALU K[.FFFF],SC ALU,LAB R[6] ; TEST INSTRUCTION
:2774 KMX/.FFFF,EBMX/KMX,EALU/B ; CHANGE THE SC CONTENTS
:2775 SMX/FE,SCK/LOAD,ALU_LA[AND]Q,RC[0E] ALU,Q_ALU ; TEST INSTRUCTION
:2776 D_SC,RC[0D] ALU ; READ THE RESULT
:2777 A[U_Q-D,CLK.UBCC ; IS IT CORRECT?
:2778 Z?
:2779 =0 ERROR1 ; REPORT ERROR.
:2780 LAB R[4],ALU NOT.LA,Q_ALU,SC ALU ; TEST COMPLEMENT PATTERN
:2781 EALU/A,FER/LOAD,ALU 07(K),SC ALU,LAB R[6] ; TEST INSTRUCTION
:2782 KMX/ZERO,EBMX/KMX,EALU/B ; CHANGE SC
:2783 SMX/FE,SCK/LOAD,ALU_LA[AND]Q,RC[0E] ALU,Q_ALU ; READ FE
:2784 D_SC,RC[0D] ALU ; GET THE RESULT.
:2785 A[U_Q-D,CLK.UBCC ; IS IT CORRECT?
:2786 Z?
:2787 =0 ERROR1 ; REPORT ERROR
:2788 LAB R[5] ; HAVE ALL PATTERNS BEEN TRIED?
:2789 R[5]_LA-K[.1],CLK.UBCC
:2790 Z?
:2791 =0 LAB R[4],J/EXPD2 ; IF NOT SHIFT DATA AND CONTINUE
:2792 J/EXPD3
:2793 EXPD2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPD1
:2794 EXPD3: NOP

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U 116A, 0000,003D,0180,0800,0000,10B2
U 116B, 0018,0038,0980,09F8,0000,12F0
U 12F0, 0018,0038,8580,0AA8,0000,12F1
U 12F1, 0818,0038,6180,0800,0000,116C
U 116C, 0100,003D,0380,0800,0000,101F
U 116D, 0001,003C,0180,0AB0,0000,12F2
U 12F2, 0018,0038,0580,0AA0,0000,116E
U 116E, 0000,003D,0180,0800,0000,111C
U 116F, 0000,003C,01C0,0A20,0082,12F3
U 12F3, 0018,0038,C180,0A30,0182,12F4
U 12F4, 0000,003C,C180,0800,0004,72F5
U 12F5, 001C,0034,01C0,09F0,0081,12F6
U 12F6, 0818,0038,1D80,09E8,0000,12F7
U 12F7, 001D,2000,0180,0800,0010,12F8
U 12F8, 0000,013C,0180,0800,0000,1170
U 1170, 0000,003D,0180,0800,0000,111E
U 1171, 0000,0028,01C0,0A20,0082,12F9
U 12F9, 0018,0038,1980,0A30,0182,12FA
U 12FA, 0000,003C,1980,0800,0004,72FB
U 12FB, 001C,0034,01C0,09F0,0081,12FC
U 12FC, 0818,0038,1D80,09E8,0000,12FD
U 12FD, 001D,2000,0180,0800,0010,12FE
U 12FE, 0000,013C,0180,0800,0000,1172
U 1172, 0000,003D,0180,0800,0000,111E
U 1173, 0000,003C,0180,0A28,0000,12FF
U 12FF, 0018,0000,0580,0AA8,0010,1300
U 1300, 0000,013C,0180,0800,0000,1174
U 1174, 0000,003C,0180,0A20,0000,1301
U 1175, 0000,003C,0180,0800,0000,1302
U 1301, 0020,003C,0100,0AA0,0000,116F
U 1302, 0000,003C,0180,0800,0000,1176

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U 1176. 0000,003D,0180,0800,0000,10B2
U 1177. 0018,0038,0980,09F8,0000,1303
U 1303. 0018,0038,8580,0AA8,0000,1304
U 1304. 0818,0038,6180,0800,0000,1178
U 1178. 0100,003D,0380,0800,0000,101F
U 1179. 0001,003C,0180,0AB0,0000,1305
U 1305. 0018,0038,0580,0AA0,0000,117A
U 117A. 0000,003D,0180,0800,0000,111C
U 117B. 0000,003C,01C0,0A20,0082,1306
U 1306. 0018,0038,1980,0A30,0182,1307
U 1307. 001C,0034,1DC0,09F0,0080,7308
U 1308. 0818,0038,1D80,09E8,0000,1309
U 1309. 001D,2000,0180,0800,0010,130A
U 130A. 0000,013C,0180,0800,0000,117C
U 117C. 0000,003D,0180,0800,0000,111E
U 117D. 0000,0028,01C0,0A20,0082,130B
U 130B. 0018,0038,C180,0A30,0182,130C
U 130C. 001C,0034,1DC0,09F0,0080,730D
U 130D. 0818,0038,1D80,09E8,0000,130E
U 130E. 001D,2000,0180,0800,0010,130F
U 130F. 0000,013C,0180,0800,0000,117E
U 117E. 0000,003D,0180,0800,0000,111E
U 117F. 0000,003C,0180,0A28,0000,1310
U 1310. 0018,0000,0580,0AA8,0010,1311
U 1311. 0000,013C,0180,0800,0000,1180
U 1180. 0000,003C,0180,0A20,0000,1312
U 1181. 0000,003C,0180,0800,0000,1313
U 1312. 0020,003C,0100,0AA0,0000,117B
U 1313. 0000,003C,0180,0800,0000,1182

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.PAGE "TEST 69 EBMX/FE TEST"
*****
++
TEST 69 EBMX/FE TEST
TEST DESCRIPTION
THIS IS A TEST OF THE FE INPUTS TO THE EBMX. TEST DATA
IS GENERATED BY FLOATING A 1 IN 0'S AND A 0 IN 1'S.
LOGIC DESCRIPTION
ERROR DESCRIPTION
EXPECTED DATA
GOT DATA
--
*****
=0
EXPE: NEWTST
RC[0F]_K[.2]
R[5]_K[.C] ; SET UP A COUNTER, R[5]=0C
D_K[.F] ; SET UP A MASK, R[6]=3FF
D-D.LEFT2,SI/7,CALL,J/DCF
R[6]_D
R[4]_K[.1] ; INITIALIZE THE DATA PATTERN
=0
ERLOOP
EXPE1: LAB R[4],ALU/LA,SC ALU,Q_ALU ; SET UP THE OPERAND
EALD/A,FEK/LOAD,ALD_0(K),SC ALU,LAB R[6] ; LOAD FE
; TEST INSTRUCTION:
EBMX/FE,KMX/SC,EALU/B,SC EALU,ALU_LA[AND]Q,R[0E]_ALU,Q_ALU
D_SC,R[0D]_ALU ; GET THE RESULT
A[U_Q-D,CLK,UBCC ; WAS IT CORRECT?
Z?
=0
ERROR1 ; REPORT ERROR.
; NOW TEST COMPLEMENT DATA
LAB R[4],AMX/LA,ALU/NOTA,SC ALU,Q_ALU ; SET UP THE OPERAND
EALD/A,FEK/LOAD,ALU_K[.FFFF],SC A[U,LAB R[6] ; LOAD FE
; TEST INSTRUCTION:
EBMX/FE,KMX/SC,EALU/B,SC EALU,ALU_LA[AND]Q,R[0E]_ALU,Q_ALU
D_SC,R[0D]_ALU ; GET THE RESULT
A[U_Q-D,CLK,UBCC ; WAS IT CORRECT?
Z?
=0
ERROR1 ; REPORT ERROR
LAB R[5] ; HAVE ALL PATTERNS BEEN TRIED?
R[5]_LA-K[.1],CLK,UBCC
Z?
=0
LAB R[4],J/EXPE2 ; IF NOT SHIFT DATA AND CONTINUE.
J/EXPE3
EXPE2: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPE1
EXPE3: NOP

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16-DEC-82 10:57:29

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U 1182, 0000,003D,0180,0800,0000,10B2
U 1183, 0018,0038,0980,09F8,0000,1314
U 1314, 0018,0038,8580,0AAB,0000,1315
U 1315, 0018,0038,4980,0AB0,0000,1316
U 1316, 0018,0038,0580,0A98,0000,1317
U 1317, 0018,0038,4180,0AA0,0000,1184
U 1184, 0000,003D,0180,0800,0000,111C
U 1185, 0000,003C,01C0,0A18,0000,1318
U 1318, 0018,0038,1980,0A20,0082,1319
U 1319, 0000,003C,0180,0800,0100,131A
U 131A, 0000,003C,1D80,0800,0088,731B
U 131B, 0000,003C,0180,0A30,0000,131C
U 131C, 001C,0034,01C0,09F0,0000,131D
U 131D, 0818,0038,1D80,09E8,0000,131E
U 131E, 001D,2000,0180,0800,0010,131F
U 131F, 0000,013C,0180,0800,0000,1186
U 1186, 0000,003D,0180,0800,0000,111E
U 1187, 0000,0028,01C0,0A18,0000,1320
U 1320, 0018,0038,C180,0A20,0082,1321
U 1321, 0000,0028,0180,0AC0,0100,1322
U 1322, 0000,003C,1D80,0A40,0088,7323
U 1323, 0000,003C,0180,0A30,0000,1324
U 1324, 001C,0034,01C0,09F0,0000,1325
U 1325, 0818,0038,1D80,09E8,0000,1326
U 1326, 001D,2000,0180,0A28,0010,1327
U 1327, 0000,013C,0180,0800,0000,1188
U 1188, 0000,003D,0180,0800,0000,111E
U 1189, 0000,003C,0180,0A28,0000,1328
U 1328, 0018,0000,0580,0AAB,0010,1329
U 1329, 0000,013C,0180,0800,0000,118A
U 118A, 0000,003C,0180,0A20,0000,132A
U 118B, 0000,003C,0180,0800,0000,132D
U 132A, 0020,003C,0100,0AA0,0000,132B
U 132B, 0000,003C,0180,0A18,0000,132C

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.PAGE 'TEST 6A EBMX/AMX.EXP TEST'
*****
**
TEST 6A EBMX/AMX.EXP TEST

TEST DESCRIPTION
THIS IS A TEST OF THE AMX.EXP (AMX<14:07>) INPUTS TO THE
EBMX. TEST PATTERNS ARE GENERATED BY FLOATING A 1 THROUGH
0'S AND A 0 THROUGH 1'S.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED DATA
GOT DATA

--
*****
=0
EXP1: NEWTST
      RC[0F] K[.2]
      R[5] K[.C] ; SET UP A COUNTER R[5]=0C
      R[6] K[.FF] ; SET UP A MASK, R[6]=OFF
      R[3] K[.1] ; SET UP THE EXPECTED DATA PATTERN
      R[4] K[.80] ; INITIALIZE THE TEST DATA PATTERN
=0
EXP1: Q R[3] ; EXPECTED RESULT
      LAB R[4],ALU 0(K),SC,ALU ; SC=0
      EALD/A,FE,EALU ; FE=0
      ; TEST INSTRUCTION
      AMX/LA,EBMX/AMX.EXP,EALU/B,SC,EALU,KMX/SC
      LAB R[6] ; COMPUTE EXPECTED RESULT
      ALU LA[AND]Q,RC[0E],ALU,Q,ALU
      D SC,RC[0D],ALU ; GET ACTUAL RESULT
      ALU Q-D,CLK,UBCC ; WAS IT CORRECT?
      Z?
=0
      ERROR1 ; REPORT ERROR.
      LAB R[3],ALU NOT.LA,Q,ALU ; COMPLEMENT DATA PATTERN
      LAB R[4],ALU K[.FFFF],SC,ALU ; SC=3FF
      EALD/A,FE,EALU,ALU NOT.LA,R[8],ALU ; FE=3FF
      ; TEST INSTRUCTION
      LAB R[8],AMX/LA,EBMX/AMX.EXP,EALU/B,SC,EALU,KMX/SC
      LAB R[6] ; COMPUTE EXPECTED RESULT
      ALU LA[AND]Q,RC[0E],ALU,Q,ALU
      D SC,RC[0D],ALU ; GET ACTUAL RESULT
      ALU Q-D,CLK,UBCC,LAB R[5] ; WAS IT CORRECT?
      Z?
=0
      ERROR1 ; REPORT ERROR
      LAB R[5]
      R[5] LA-K[.1],CLK,UBCC ; TRIED ALL PATTERNS?
      Z?
=0
      LAB R[4],J/EXP2 ; IF NOT SHIFT DATA AND CONTINUE
      J/EXP3
EXP2: AMX/LA,ALU/A,SHF/LEFT,S1/2,R[4],SHF
      LAB R[3]

```


J 2

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SEQ 0224
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```
U 132C, 0020,003C,0100,0A98,0000,1185 ;2900
U 132D, 0000,003C,0180,0800,0000,118C ;2901
```

EXP3: AMX/LA,ALU/A,SHF/LEFT,SI/2,R[3]_SHF,J/EXP3
NOP

```

:2902 .PAGE 'TEST 6B STATE REGISTER AND EAMX/STATE TEST'
:2903 *****
:2904 ++
:2905 TEST 6B STATE REGISTER AND EAMX/STATE TEST
:2906
:2907 TEST DESCRIPTION
:2908 THIS IS A TEST OF THE MSC/LOAD STATE FUNCTION,
:2909 THE STATE REGISTER'S DATA INTEGRITY AND THE STATE
:2910 REGISTER INPUTS TO THE EAMX. TEST DATA IS GENERATED
:2911 BY FLOATING A 1 IN 0'S AND A 0 IN 1'S.
:2912
:2913 LOGIC DESCRIPTION
:2914 NOTE THAT THE EAMX SELECT CONTROL IS DICTATED BY THE
:2915 MSC FUNCTION LOAD STATE. IF THE MSC FUNCTION IS LOAD STATE
:2916 THEN THE EAMX SELECTS THE STATE REGISTER, OTHERWISE
:2917 IT SELECTS THE SC.
:2918
:2919 ERROR DESCRIPTION
:2920 EXPECTED DATA
:2921 GOT DATA
:2922
:2923 --
:2924 *****
:2925 =0
:2926 EXPG: NEWTST
:2927 RCCOF]_K[.2]
:2928 R[5]_K[.9] ; SET UP A COUNTER, R[5]=9
:2929 R[6]_K[.FF] ; SET UP A MASK, R[6]=OFF
:2930 R[4]_K[.1] ; INITIALIZE THE TEST DATA PATTERN
:2931 =0
:2932 EXPG1: LAB_R[4],ALU_LA,SC_ALU,Q_ALU ; SET UP THE OPERAND
:2933 ; LOAD STATE
:2934 EBMX_K[SC],EALU/B,MSC/LOAD.STATE,ALU_O(A),SC_ALU,LAB_R[6]
:2935 KMX/.FFFF,EBMX/KMX,EALU/B ; INSTRUCTION TO CHANGE STATE INPUTS
:2936 ; TO INSURE STATE ISN'T ALWAYS
:2937 ; BEING CLOCKED.
:2938 ; READ STATE
:2939 MSC/LOAD.STATE,EALU/A,SC_EALU,ALU_LA[AND]Q,RCCOF]_ALU,Q_ALU
:2940 D_SC,RCCOF]_ALU ; GET THE RESULT
:2941 ACU_Q-D,CLK_UBCC ; IS IT CORRECT?
:2942 Z?
:2943 =0
:2944 ERROR1 ; REPORT ERROR
:2945 LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU,Q_ALU ; TEST COMPLEMENT DATA
:2946 EBMX_K[SC],EALU/B,MSC/LOAD.STATE ; LOAD STATE
:2947 ALU_K[.FFFF],SC_ALU,LAB_R[6] ; THIS INSTRUCTION CHANGES THE
:2948 ; DATA AT THE STATE REGISTER
:2949 ; INPUTS, INSURING THAT THE
:2950 ; REGISTER IS NOT ALWAYS
:2951 ; BEING CLOCKED
:2952 ; READ STATE
:2953 MSC/LOAD.STATE,EALU/A,SC_EALU,ALU_LA[AND]Q,RCCOF]_ALU,Q_ALU
:2954 KMX/ZERO,EBMX/KMX,EALU/B
:2955 D_SC,RCCOF]_ALU ; GET RESULT
:2956 ACU_Q-D,CLK_UBCC ; IS IT CORRECT?
:2957 Z?

```

U 118C. 0000,003D,0180,0800,0000,10B2
 U 118D. 0018,0038,0980,09F8,0000,132E
 U 132E. 0018,0038,D980,0AA8,0000,132F
 U 132F. 0018,0038,4980,0AB0,0000,1330
 U 1330. 0018,0038,0580,0AA0,0000,118E
 U 118E. 0000,003D,0180,0800,0000,111C
 U 118F. 0000,003C,01C0,0A20,0082,1331
 U 1331. 0003,003C,1D80,0A30,1486,7332
 U 1332. 0000,003C,C180,0800,0004,7333
 U 1333. 001C,0034,01C0,09F0,1480,1334
 U 1334. 0818,0038,1D80,09E8,0000,1335
 U 1335. 001D,2000,0180,0800,0010,1336
 U 1336. 0000,013C,0180,0800,0000,1190
 U 1190. 0000,003D,0180,0800,0000,111E
 U 1191. 0000,0028,01C0,0A20,0082,1337
 U 1337. 0000,003C,1D80,0800,1404,7338
 U 1338. 0018,0038,C180,0A30,0082,1339
 U 1339. 001C,0034,01C0,09F0,1480,133A
 U 133A. 0000,003C,1980,0800,0004,733B
 U 133B. 0818,0038,1D80,09E8,0000,133C
 U 133C. 001D,2000,0180,0800,0010,133D
 U 133D. 0000,013C,0180,0800,0000,1192

ZZ-ESKAH-V132 TEST 6B STATE REGISTER AND EAMX/STATE TEST L 2
ESKAH23.MCR MICRO2 1M(01) 16-DEC-82 10:57:29

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U 1192, 0000,003D,0180,0800,0000,111E :2957 =0 ERROR1 ; REPORT ERROR
U 1193, 0000,003C,0180,0A28,0000,133E :2958 LAB R[5]
U 133E, 0018,0000,0580,0AA8,0010,133F :2959 R[5]_LA-K[.1],CLK.UBCC ; TRIED ALL DATA PATTERNS?
U 133F, 0000,013C,0180,0800,0000,1194 :2960 Z?
U 1194, 0000,003C,0180,0A20,0000,1340 :2961 =0 LAB R[4],J/EXPG2 ; IF NOT SHIFT DATA AND CONTINUE.
U 1195, 0000,003C,0180,0800,0000,1341 :2962 J/EXPG3
U 1340, 0020,003C,0100,0AA0,0000,118F :2963 EXPG2: ALU_LA,SHF/LEFT,SI/2,R[4]_SHF,J/EXPG1
U 1341, 0000,003C,0180,0800,0000,1196 :2964 EXPG3: NOP
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:2990
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:2994
:2995
:2996
:2997
:2998
:2999
:3000
:3001
:3002
:3003
:3004
:3005
:3006
:3007
:3008
:3009
:3010
:3011
:3012
:3013
:3014
:3015
:3016
:3017
:3018
:3019
U 1196, 0000,003D,0180,0800,0000,10B2
U 1197, 0818,0038,1180,0800,0000,1342
U 1342, 0019,0014,0580,09F8,0000,1343
U 1343, 0018,0038,D580,0AC8,0000,1198
U 1198, 0000,003D,0180,0800,0000,11F5
U 1199, 0018,0038,6580,0AF0,0000,1344
U 1344, 0018,0038,8180,0AE8,0000,1345
U 1345, 0800,003C,0180,0A48,0000,119A
U 119A, 0018,1939,1980,0AF8,0000,1090
U 119B, 0003,003C,0180,0A98,0000,1346
U 1346, 0000,003C,0180,0A70,0000,1347

```

```

.PAGE 'TEST 6C EALU TEST'
*****
++
TEST 6C EALU TEST

TEST DESCRIPTION
THIS IS A TEST OF EXPONENT SECTION'S ALU. ALL
EALU FUNCTIONS ARE TESTED, EXCEPT EALU/NABS.A-B
WHICH IS TESTED IN THE NEXT TEST. TEST DATA
PATTERNS ARE GENERATED IN SUCH A WAY AS TO TRY
EVERY POSSIBLE COMBINATION OF A<3:0>, B<3:0>
AND CIN WITH EACH FUNCTION ON EACH 4 BIT SLICE
ALU CHIP IN THE CIRCUIT.
SUBTEST 1 TESTS THE FUNCTION A
SUBTEST 2 TESTS THE FUNCTION B
SUBTEST 3 TESTS THE FUNCTION A.OR.B
SUBTEST 4 TESTS THE FUNCTION A.ANDNOT.B
SUBTEST 5 TESTS THE FUNCTION A.PLUS.B
SUBTEST 6 TESTS THE FUNCTION A.MINUS.B
SUBTEST 7 TESTS THE FUNCTION A.PLUS.1
NOTE THAT EXPECTED RESULTS ARE CALCULATED USING
THE 32 BIT ALU IN THE DATA PATHS WHICH HAS ALREADY
BEEN TESTED.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT
A OPERAND (FROM SC)
B OPERAND (FROM FE)
EALU FUNCTION BEING TESTED AS GIVEN BY:
        6      A
        5      B
        4      A.OR.B
        3      A.ANDNOT.B
        2      A.PLUS.B
        1      A.MINUS.B
        0      A.PLUS.1

--
*****
=0
EALU:  NEWTST
      D K[.4]
      A[U D+K[.1],R[OF]_ALU
      R[9]_K[.6]          : SET UP A FUNCTION COUNTER.

=0
EALU1: SUBTEST
      R[OE]_K[.10]        : SET UP AN OPERAND COUNTER
      R[OD]_K[.3FF]       : SET UP A MASK
      D R[9]              : GO SET UP THE LOOP ON ERROR
=0      A[U 0(K),R[OF]_ALU,CALL,D3-0?,J/EALUT1 : ADDRESS
      R[3] 0              : INITIALIZE THE A OPERAND
      LAB_R[OE]           : AND COUNTER.

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U 1347. 0000,003C,0180,0AB0,0000,1348 :3020
:3021
: FIRST TEST EALU<03:00>
U 1348. 0003,003C,0180,0AA0,0000,1349 :3022
EALU2: R[4] 0 : INITIALIZE THE B OPERAND
: AND COUNTER.
U 1349. 0000,003C,0180,0A70,0000,134A :3023
: LAB R[0E]
U 134A. 0000,003C,0180,0AB8,0000,134B :3024
: R[7] LA
U 134B. 0000,003C,0180,0A20,0082,134C :3025
EALU3: SC R[4] : PUT B OPERAND IN FE
: FE-SC, SC_R[3] : PUT A OPERAND IN SC
U 134C. 0000,003C,0180,0A18,0182,134D :3026
: D R[9]
U 134D. 0800,003C,0180,0A48,0000,119C :3027
: =0 CALL,D3-0?,J/EALUT2 : GO TO THE ROUTINE WHICH SIMUALTES
: EXECUTES AND CHECKS
: THE RESULT OF THIS
: FUNCTION WITH THESE OPERANDS.
U 119C. 0000,193D,0180,0800,0000,10A0 :3028
:3029
:3030
:3031
: R[7]_LA-K[.1],CLK.UBCC
:3032
:3033
:3034
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U 1369, 0003,003C,0180,0AA0,0000,136A :3075
U 136A, 0000,003C,0180,0A70,0000,136B :3076
U 136B, 0000,003C,0180,0AB8,0000,136C :3077
U 136C, 0000,003C,0180,0A20,0082,136D :3078
U 136D, 0000,003C,0180,0A18,0182,136E :3079
U 136E, 0800,003C,0180,0A48,0000,11AA :3080
U 11AA, 0000,193D,0180,0800,0000,10A0 :3081
:3082
U 11AB, 0018,0000,0580,0AB8,0010,136F :3083
U 136F, 0000,013C,0180,0800,0000,11AC :3084
U 11AC, 0800,003C,0180,0A20,0000,1370 :3085
U 11AD, 0000,003C,0180,0A30,0000,1372 :3086
U 1370, 0000,003C,0180,0A28,0000,1371 :3087
U 1371, 001C,2014,0180,0AA0,0000,136C :3088
U 1372, 0018,0000,0580,0AB0,0010,1373 :3089
U 1373, 0000,013C,0180,0800,0000,11AE :3090
U 11AE, 0800,003C,0180,0A18,0000,1375 :3091
U 11AF, 0000,003C,0180,0A48,0010,1374 :3092
U 1374, 0000,013C,0180,0800,0000,11B0 :3093
U 1375, 0000,003C,0180,0A28,0000,1376 :3094
U 1376, 001C,2014,0180,0A98,0000,1369 :3095
:3096
U 11B0, 0018,0000,0580,0AC8,0000,1198 :3097
:3098
:3099
U 11B1, 0000,003C,0180,0800,0000,13B6 :3100
:3101
:3102
:3103
:3104
:3105
:3106
U 11B2, 0000,003D,0180,0800,0000,111C :3107
U 11B3, 0800,003C,0180,0A78,0000,1377 :3108
U 1377, 0000,0D3C,0180,0800,0000,10DD :3109
U 10DD, 0018,003A,C180,0AF8,0000,0001 :3110
:3111
:3112
U 10DF, 0000,003C,01C0,0A18,0000,1378 :3113
U 1378, 0000,003C,0180,0A68,0000,1379 :3114
U 1379, 001C,0034,01C0,0A88,0000,137A :3115
U 137A, 0000,003C,0180,0800,0080,137B :3116
U 137B, 0818,0038,1D80,0A90,0000,137C :3117
U 137C, 001D,2000,0180,0800,0010,137D :3118
U 137D, 0000,013C,0180,0800,0000,11B4 :3119
U 11B4, 0000,003C,0180,0800,0000,13AC :3120
U 11B5, 0000,003E,0180,0A38,0000,0001 :3121
:3122
:3123
:3124
:3125
:3126
:3127
U 11B6, 0000,003D,0180,0800,0000,111C :3128
U 11B7, 0800,003C,0180,0A78,0000,137E :3129

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EALU22: R[4] 0 ; INITIALIZE THE BOPERAND
LAB_R[0E] ; AND COUNTER
R[7] LA
EALU23: SC_R[4] ; PUT B OPERAND IN FE
FE-SC,SC,R[3] ; PUT A OPERAND IN SC
D_R[9]
=0 CALL,D3-0?,J/EALUT2 ; GO EXECUTE AND CHECK THE
; FUNCTION WITH THESE OPERANDS.
; HAVE ALL B OPERANDS BEEN TRIED?
R[7]_LA-K[.1],CLK.UBCC
Z?
=0 D_R[4],J/EALU24 ; IF NOT INCREMENT AND CONTINUE
LAB_R[6],J/EALU25 ; ELSE CHECK A OPERAND
EALU24: LAB_R[5]
ALU_LA[A+B]D,R[4]_ALU,J/EALU23
EALU25: R[6]_LA-K[.1],CLK.UBCC ; HAVE ALL A OPERANDS BEEN TRIED?
Z?
=0 D_R[3],J/EALU26 ; IF NOT INCREMENT AND CONTINUE
ALU_R[9],CLK.UBCC ; SEE IF ALL FUNCTIONS HAVE
Z?,J/EALU27 ; BEEN TESTED.
EALU26: LAB_R[5]
ALU_LA[A+B]D,R[3]_ALU,J/EALU22
=0
EALU27: R[9]_LA-K[.1],J/EALU1 ; IF ALL FUNCTIONS HAVE NOT BEEN
; TESTED THEN DECREMENT COUNTER
; AND CONTINUE
; ELSE DONE!
J/EALU100
:////////////////////
:
: SUBTEST 1
: EALU/A
:
:
=0
EALU1: ERLOOP
D_R[0F] ; SEE IF THIS CALL WAS
SIGNS? ; TO SET THE LOOP ON ERROR
=101 ALU_K[FFFF],R[0F]_ALU,RETURN1 ; ADDRESS
; OR DID AN ERROR OCCUR
; WITH THE LOOP ON ERROR FLAG SET
Q_R[3]
EALUX1: LAB_R[0D] ; COMPUTE EXPECTED RESULT.
ALU_LA[AND]Q,R[1]_ALU,Q_ALU
EBMX/FE,EALU/A,SC_EALU ; TEST INSTRUCTION
D_SC,R[2]_ALU ; GET ACTUAL RESULT
ALU_Q-D,C[.K.UBCC] ; WAS IT CORRECT?
Z?
=0 J/EALUER ; GO REPORT THE ERROR.
LAB_R[7],RETURN1
:////////////////////
:
: SUBTEST 2
: EALU/B
:
:
=0
EALU2: ERLOOP
D_R[0F] ; SEE IF THIS CALL WAS

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U 137E, 0000,0D3C,0180,0800,0000,10E5 :3130
U 10E5, 0018,003A,C180,0AF8,0000,0001 :3131
:3132
:3133
U 10E7, 0000,003C,01C0,0A20,0000,137F :3134
U 137F, 0000,003C,0180,0A68,0000,1380 :3135
U 1380, 001C,0034,01C0,0A88,0000,1381 :3136
U 1381, 0000,003C,0180,0800,0080,7382 :3137
U 1382, 0818,0038,1D80,0A90,0000,1383 :3138
U 1383, 001D,2000,0180,0800,0010,1384 :3139
U 1384, 0000,013C,0180,0800,0000,11B8 :3140
U 11B8, 0000,003C,0180,0800,0000,13AC :3141
U 11B9, 0000,003E,0180,0A38,0000,0001 :3142
:3143
:3144
:3145
:3146
:3147
:3148
U 11BA, 0000,003D,0180,0800,0000,111C :3149
U 11BB, 0800,003C,0180,0A78,0000,1385 :3150
U 1385, 0000,0D3C,0180,0800,0000,10ED :3151
U 10ED, 0018,003A,C180,0AF8,0000,0001 :3152
:3153
:3154
U 10EF, 0000,003C,01C0,0A18,0000,1386 :3155
U 1386, 0000,003C,0180,0A20,0000,1387 :3156
U 1387, 001C,0030,01C0,0A88,0000,1388 :3157
U 1388, 0000,003C,0180,0800,0080,3389 :3158
U 1389, 0818,0038,1D80,0A90,0000,138A :3159
U 138A, 001D,2000,0180,0800,0010,138B :3160
U 138B, 0000,013C,0180,0800,0000,11BC :3161
U 11BC, 0000,003C,0180,0800,0000,13AC :3162
U 11BD, 0000,003E,0180,0A38,0000,0001 :3163
:3164
:3165
:3166
:3167
:3168
:3169
U 11BE, 0000,003D,0180,0800,0000,111C :3170
U 11BF, 0800,003C,0180,0A78,0000,138C :3171
U 138C, 0000,0D3C,0180,0800,0000,10F5 :3172
U 10F5, 0018,003A,C180,0AF8,0000,0001 :3173
:3174
:3175
U 10F7, 0000,0028,01C0,0A20,0000,138D :3176
U 138D, 0000,003C,0180,0A18,0000,138E :3177
U 138E, 001C,0034,01C0,0A88,0000,138F :3178
U 138F, 0000,003C,0180,0800,0080,5390 :3179
U 1390, 0818,0038,1D80,0A90,0000,1391 :3180
U 1391, 001D,2000,0180,0800,0010,1392 :3181
U 1392, 0000,013C,0180,0800,0000,11C0 :3182
U 11C0, 0000,003C,0180,0800,0000,13AC :3183
U 11C1, 0000,003E,0180,0A38,0000,0001 :3184

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SIGN? : TO SET THE LOOP ON ERROR
=101 ALU_K[.FFFF],R[OF]_ALU,RETURN1 : ADDRESS
: OR DID AN ERROR OCCUR
: WITH THE LOOP ON ERROR FLAG SET

EALUX2: LAB_R[0D] : COMPUTE THE EXPECTED RESULT.
ALU_LA[AND]Q,R[1]_ALU,Q_ALU
EBMX/FE,EALU/B,SC_EALU : TEST INSTRUCTION
D SC,R[2]_ALU : GET THE ACTUAL RESULT
ALU_Q-D,C[K.UBCC] : WAS IT CORRECT
Z?
=0 J/EALUER : REPORT ERROR
LAB_R[7],RETURN1
://///////7/////////

: +
: SUBTEST 3
: EALU/A.OR.B
: -
: =0
EALUL3: ERLOOP
D R[OF] : SEE IF THIS CALL WAS
SIGN? : TO SET THE LOOP ON ERROR
=101 ALU_K[.FFFF],R[OF]_ALU,RETURN1 : ADDRESS
: OR DID AN ERROR OCCUR
: WITH THE LOOP ON ERROR FLAG SET

EALUX3: LAB_R[4] : COMPUTE EXPECTED RESULT
ALU_LA[OR]Q,Q_ALU,R[1]_ALU
EBMX/FE,EALU/OR,SC_EALD : TEST INSTRUCTION
D SC,R[2]_ALU : GET THE ACTUAL RESULT
ALU_Q-D,C[K.UBCC] : WAS IT CORRECT?
Z?
=0 J/EALUER : REPORT ERROR
LAB_R[7],RETURN1
://///////7/////////

: +
: SUBTEST 4
: EALU/A.ANDNOT.B
: -
: =0
EALUL4: ERLOOP
D R[OF] : SEE IF THIS CALL WAS
SIGN? : TO SET THE LOOP ON ERROR
=101 ALU_K[.FFFF],R[OF]_ALU,RETURN1 : ADDRESS
: OR DID AN ERROR OCCUR
: WITH THE LOOP ON ERROR FLAG SET

EALUX4: LAB_R[4],ALU_NOT.LA,Q_ALU : COMPUTE EXPECTED RESULT
LAB_R[3]
ALU_LA[AND]Q,Q_ALU,R[1]_ALU
EBMX/FE,EALU/ANDNOT,SC_EALU : TEST INSTRUCTION
D SC,R[2]_ALU : GET THE ACTUAL RESULT
ALU_Q-D,C[K.UBCC] : IS IT CORRECT?
Z?
=0 J/EALUER : REPORT ERROR
LAB_R[7],RETURN1

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:3185
:3186
:3187
:3188
:3189
:3190
U 11C2, 0000,003D,0180,0800,0000,111C :3191
U 11C3, 0800,003C,0180,0A78,0000,1393 :3192
U 1393, 0000,0D3C,0180,0800,0000,10FD :3193
U 10FD, 0018,003A,C180,0AF8,0000,0001 :3194
:3195
:3196
U 10FF, 0000,003C,01C0,0A18,0000,1394 :3197
U 1394, 0000,003C,0180,0A20,0000,1395 :3198
U 1395, 001C,0014,01C0,0800,0000,1396 :3199
U 1396, 001C,0034,01C0,0A68,0000,1397 :3200
U 1397, 0001,203C,0180,0A88,0000,1398 :3201
U 1398, 0000,003C,0180,0800,0080,9399 :3202
U 1399, 0818,0038,1D80,0A90,0000,139A :3203
U 139A, 001D,2000,0180,0800,0010,139B :3204
U 139B, 0000,013C,0180,0800,0000,11C4 :3205
U 11C4, 0000,003C,0180,0800,0000,13AC :3206
U 11C5, 0000,003E,0180,0A38,0000,0001 :3207
:3208
:3209
:3210
:3211
:3212
:3213
U 11C6, 0000,003D,0180,0800,0000,111C :3214
U 11C7, 0800,003C,0180,0A78,0000,139C :3215
U 139C, 0000,0D3C,0180,0800,0000,1115 :3216
U 1115, 0018,003A,C180,0AF8,0000,0001 :3217
:3218
:3219
:3220
U 1117, 0000,003C,01C0,0A20,0000,139D :3221
U 139D, 0000,003C,0180,0A18,0000,139E :3222
U 139E, 001C,0000,01C0,0800,0000,139F :3223
U 139F, 001C,0034,01C0,0A68,0000,13A0 :3224
U 13A0, 0001,203C,0180,0A88,0000,13A1 :3225
U 13A1, 0000,003C,0180,0800,0080,B3A2 :3226
U 13A2, 0818,0038,1D80,0A90,0000,13A3 :3227
U 13A3, 001D,2000,0180,0800,0010,13A4 :3228
U 13A4, 0000,013C,0180,0800,0000,11C8 :3229
U 11C8, 0000,003C,0180,0800,0000,13AC :3230
U 11C9, 0000,003E,0180,0A38,0000,0001 :3231
:3232
:3233
:3234
:3235
:3236
U 11CA, 0000,003D,0180,0800,0000,111C :3237
U 11CB, 0800,003C,0180,0A78,0000,13A5 :3238
U 13A5, 0000,0D3C,0180,0800,0000,111D :3239

```

```

://///////////////
:
: SUBTEST      5
: EALU/A.PLUS.B
:
: =0
EALUL5: ERLOOP
: D R[0F]          ; SEE IF THIS CALL WAS
: SIGNS?          ; TO SET THE LOOP ON ERROR
=101 ALU_K[.FFFF],R[0F],ALU,RETURN1 ; ADDRESS
: OR DID AN ERROR OCCUR
: WITH THE LOOP ON ERROR FLAG SET

: Q R[3]
EALUX5: LAB_R[4]          ; COMPUTE THE EXPECTED RESULT
: ALU_LA[A+B]Q,Q,ALU
: LAB_R[0D],ALU_[A[AND]Q,Q,ALU
: R[1] Q
: EBMX7FE,EALU/A+B,SC_EALU ; TEST INSTRUCTION
: D SC,R[2] ALU      ; GET THE ACTUAL RESULT
: ACU_Q-D,C[K.UBCC  ; IS IT CORRECT
: Z?
: =0
: J/EALUER          ; REPORT THE ERROR
: LAB_R[7],RETURN1
://///////////////
:
: SUBTEST      6
: EALU/A.MINUS.B
:
: =0
EALUL6: ERLOOP
: D R[0F]          ; SEE IF THIS CALL WAS
: SIGNS?          ; TO SET THE LOOP ON ERROR
=101 ALU_K[.FFFF],R[0F],ALU,RETURN1 ; ADDRESS
: OR DID AN ERROR OCCUR
: WITH THE LOOP ON ERROR FLAG SET

: Q R[4]
EALUX6: LAB_R[3]          ; COMPUTE THE EXPECTED RESULT
: ALU_LA[A-B]Q,Q,ALU
: LAB_R[0D],ALU_[A[AND]Q,Q,ALU
: R[1] Q
: EBMX7FE,EALU/A-B,SC_EALU ; TEST INSTRUCTION
: D SC,R[2] ALU      ; GET THE ACTUAL RESULT
: ACU_Q-D,C[K.UBCC  ; IS IT CORRECT?
: Z?
: =0
: J/EALUER          ; REPORT THIS ERROR
: LAB_R[7],RETURN1
://///////////////
:
: SUBTEST      7
: EALU/A.PLUS.1
:
: =0
EALUL7: ERLOOP
: D R[0F]          ; SEE IF THIS CALL WAS
: SIGNS?          ; TO SET THE LOOP ON ERROR

```



```

U 111D, 0018,003A,C180,0AF8,0000,0001 :3240
:3241
:3242
U 111F, 0000,003C,01C0,0A18,0000,13A6 :3243
U 13A6, 0019,2014,05C0,0A68,0000,13A7 :3244
U 13A7, 001C,0034,01C0,0A88,0000,13A8 :3245
U 13A8, 0000,003C,0180,0800,0080,D3A9 :3246
U 13A9, 0818,0038,1D80,0A90,0000,13AA :3247
U 13AA, 001D,2000,0180,0800,0010,13AB :3248
U 13AB, 0000,013C,0180,0800,0000,11CC :3249
U 11CC, 0000,003C,0180,0800,0000,13AC :3250
U 11CD, 0000,003E,0180,0A38,0000,0001 :3251
:3252
:3253
:3254
:3255
:3256
:3257
:3258
:3259
:3260
:3261
:3262
:3263
:3264
:3265
:3266
:3267
:3268
U 13AC, 0000,003C,0180,0A08,0000,13AD :3269
U 13AD, 0000,003C,0180,09F0,0000,13AE :3270
U 13AE, 0000,003C,0180,0A10,0000,13AF :3271
U 13AF, 0000,003C,0180,09E8,0000,13B0 :3272
U 13B0, 0000,003C,0180,0A18,0000,13B1 :3273
U 13B1, 0000,003C,0180,09E0,0000,13B2 :3274
U 13B2, 0000,003C,0180,0A20,0000,13B3 :3275
U 13B3, 0000,003C,0180,09D8,0000,13B4 :3276
U 13B4, 0000,003C,0180,0A48,0000,13B5 :3277
U 13B5, 0000,003D,0180,09D0,0000,111E :3278
:3279
:3280
:3281
U 1090, 0000,003C,0180,0800,0000,11CA :3282
U 1091, 0000,003C,0180,0800,0000,11C6 :3283
U 1092, 0000,003C,0180,0800,0000,11C2 :3284
U 1093, 0000,003C,0180,0800,0000,11BE :3285
U 1094, 0000,003C,0180,0800,0000,11BA :3286
U 1095, 0000,003C,0180,0800,0000,11B6 :3287
U 1096, 0000,003C,0180,0800,0000,11B2 :3288
:3289
:3290
:3291
:3292
U 10A0, 0000,003C,01C0,0A18,0000,13A6 :3293
U 10A1, 0000,003C,01C0,0A20,0000,139D :3294

```

```

=101 ALU_K[.FFFF],R[0F]_ALU,RETURN1 ; ADDRESS
; OR DID AN ERROR OCCUR
; WITH THE LOOP ON ERROR FLAG SET

Q_R[3]
EALUX7: Q-Q+K[.1],LAB R[0D] ; COMPUTE THE EXPECTED RESULT
ACU LA[AND]Q,Q ALU,R[1] ALU
EBMX/FE,EALU/A+1,SC_EALD ; TEST INSTRUCTION
D SC,R[2] ALU ; GET THE ACTUAL RESULT
ACU_Q-D,C[K.UBCC] ; IS IT CORRECT?
Z?
=0 J/EALUER ; REPORT THIS ERROR
LAB R[7],RETURN1
; WHEN AN ERROR IS DETECTED THE CONTENTS OF THE FOLLOWING
; RC SCRATCH PADS ARE TYPED:

RC[0E] = EXPECTED RESULT
RC[0D] = GOT RESULT
RC[0C] = A OPERAND (FROM SC)
RC[0B] = B OPERAND (FROM FE)
RC[0A] = EALU FUNCTION AS SHOWN BELOW

6 A
5 B
4 A.OR.B
3 A.AND.NOT.B
2 A.PLUS.B
1 A.MINUS.B
0 A.PLUS.1

EALUER: LAB R[1]
RC[0E] LA
LAB R[2]
RC[0D] LA
LAB R[3]
RC[0C] LA
LAB R[4]
RC[0B] LA
LAB R[5]
RC[0A] LA,ERROR1
; THIS TABLE IS USED TO SET THE LOOP ON ERROR ADDRESS
; FOR EACH FUNCTION:
=0000
EALUT1: J/EALUL7
J/EALUL6
J/EALUL5
J/EALUL4
J/EALUL3
J/EALUL2
J/EALUL1
=
; THIS TABLE IS USED TO INDEX TO THE ROUTINES THAT EXECUTE
; CHECK THE RESULT OF EACH FUNCTION TESTED:
=0000
EALUT2: Q_R[3],J/EALUX7
Q_R[4],J/EALUX6

```

ZZ-ESKAM-V132
ESKAM23.MCR

TEST 6C

EALU TEST

MICRO2

1M(01)

16-DEC-82 10:57:29

F 3

SEQ 0233
Page 8

U 10A2,	0000,003C,01C0,0A18,0000,1394	:3295
U 10A3,	0000,0028,01C0,0A20,0000,138D	:3296
U 10A4,	0000,003C,01C0,0A18,0000,1386	:3297
U 10A5,	0000,003C,01C0,0A20,0000,137F	:3298
U 10A6,	0000,003C,01C0,0A18,0000,1378	:3299
		:3300
U 13B6,	0000,003C,0180,0800,0000,11CE	:3301

```

Q_R[3],J/EALUX5
LAB R[4],ALU NOT.LA,Q_ALU,J/EALUX4
Q_R[3],J/EALUX3
Q_R[4],J/EALUX2
Q_R[3],J/EALUX1
=
EALU100:      NOP

```

NO	DATE	DESCRIPTION	AMOUNT	CHECK NO	BANK	INITIALS
1	1/1/20	DEPOSIT	1000.00			
2	1/15/20	PAYROLL	500.00	101	CHASE	
3	1/31/20	RENT	200.00	102	CHASE	
4	2/1/20	DEPOSIT	1000.00			
5	2/15/20	PAYROLL	500.00	103	CHASE	
6	2/28/20	RENT	200.00	104	CHASE	
7	3/1/20	DEPOSIT	1000.00			
8	3/15/20	PAYROLL	500.00	105	CHASE	
9	3/31/20	RENT	200.00	106	CHASE	
10	4/1/20	DEPOSIT	1000.00			
11	4/15/20	PAYROLL	500.00	107	CHASE	
12	4/30/20	RENT	200.00	108	CHASE	
13	5/1/20	DEPOSIT	1000.00			
14	5/15/20	PAYROLL	500.00	109	CHASE	
15	5/31/20	RENT	200.00	110	CHASE	
16	6/1/20	DEPOSIT	1000.00			
17	6/15/20	PAYROLL	500.00	111	CHASE	
18	6/30/20	RENT	200.00	112	CHASE	
19	7/1/20	DEPOSIT	1000.00			
20	7/15/20	PAYROLL	500.00	113	CHASE	
21	7/31/20	RENT	200.00	114	CHASE	
22	8/1/20	DEPOSIT	1000.00			
23	8/15/20	PAYROLL	500.00	115	CHASE	
24	8/31/20	RENT	200.00	116	CHASE	
25	9/1/20	DEPOSIT	1000.00			
26	9/15/20	PAYROLL	500.00	117	CHASE	
27	9/30/20	RENT	200.00	118	CHASE	
28	10/1/20	DEPOSIT	1000.00			
29	10/15/20	PAYROLL	500.00	119	CHASE	
30	10/31/20	RENT	200.00	120	CHASE	
31	11/1/20	DEPOSIT	1000.00			
32	11/15/20	PAYROLL	500.00	121	CHASE	
33	11/30/20	RENT	200.00	122	CHASE	
34	12/1/20	DEPOSIT	1000.00			
35	12/15/20	PAYROLL	500.00	123	CHASE	
36	12/31/20	RENT	200.00	124	CHASE	
37	1/1/21	DEPOSIT	1000.00			
38	1/15/21	PAYROLL	500.00	125	CHASE	
39	1/31/21	RENT	200.00	126	CHASE	
40	2/1/21	DEPOSIT	1000.00			
41	2/15/21	PAYROLL	500.00	127	CHASE	
42	2/28/21	RENT	200.00	128	CHASE	
43	3/1/21	DEPOSIT	1000.00			
44	3/15/21	PAYROLL	500.00	129	CHASE	
45	3/31/21	RENT	200.00	130	CHASE	
46	4/1/21	DEPOSIT	1000.00			
47	4/15/21	PAYROLL	500.00	131	CHASE	
48	4/30/21	RENT	200.00	132	CHASE	
49	5/1/21	DEPOSIT	1000.00			
50	5/15/21	PAYROLL	500.00	133	CHASE	
51	5/31/21	RENT	200.00	134	CHASE	
52	6/1/21	DEPOSIT	1000.00			
53	6/15/21	PAYROLL	500.00	135	CHASE	
54	6/30/21	RENT	200.00	136	CHASE	
55	7/1/21	DEPOSIT	1000.00			
56	7/15/21	PAYROLL	500.00	137	CHASE	
57	7/31/21	RENT	200.00	138	CHASE	
58	8/1/21	DEPOSIT	1000.00			
59	8/15/21	PAYROLL	500.00	139	CHASE	
60	8/31/21	RENT	200.00	140	CHASE	

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:3347
U 11CE, 0000,003D,0180,0800,0000,10B2
U 11CF, 0018,0038,0980,09F8,0000,13B7
U 13B7, 0F00,003C,0180,0800,0000,11D0
U 11D0, 0000,003D,0180,0800,0000,101A
U 11D1, 0018,0038,C180,0800,0000,13B8
U 13B8, 0500,003C,0380,0800,0000,11D2
U 11D2, 0000,003D,0180,0800,0000,1015
U 11D3, 0001,003C,0180,0A98,0082,11D4
U 11D4, 0F00,003D,0180,0800,0000,1019
U 11D5, 0018,0038,C180,0800,0100,13B9
U 13B9, 0500,003C,0380,0800,0000,11D6
U 11D6, 0500,003D,0180,0800,0000,1018
U 11D7, 0001,003C,0180,0AA0,0082,13BA
U 13BA, 0000,003C,0180,0800,0080,F3BB
U 13BB, 0000,003C,0180,0800,0000,11D8
U 11D8, 0F00,003D,0180,0800,0000,101F
U 11D9, 0018,0038,C180,0800,0000,13BC
U 13BC, 0500,003C,0380,0800,0000,11DA
U 11DA, 0500,003D,0180,0800,0000,101D
U 11DB, 0001,003C,01C0,09F0,0000,13BD
U 13BD, 0818,0038,1D80,09E8,0000,13BE
U 13BE, 001D,2000,0180,0800,0010,13BF
U 13BF, 0000,013C,0180,0800,0000,11DC
U 11DC, 0000,003D,0180,0800,0000,111E
U 11DD, 0000,003C,0180,0800,0000,11DE

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```

.PAGE "TEST 6D EALU/NABS.A-B TEST"
*****
**
TEST 6D EALU/NABS.A-B TEST

TEST DESCRIPTION
THIS IS A TEST OF THE EALU FUNCTION THAT
COMPUTES THE NEGATIVE ABSOLUTE VALUE OF THE
A-B. NOTE THAT NOT ALL THE ROM LOCATIONS
USED TO DO THIS FUNCTION ARE TESTED HERE. RATHER THIS IS
A TEST OF THE CONTROL LOGIC INVOLVED.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--
*****
=0
ABS2: NEWTST
RC[0F]_K[.2]
D 0 ; GENERATE SOME CONSTANTS
=0 CALL,J/DCA
ALU_K[.FFFF]
D D.LEFT,SI/7
=0 CALL,J/DC5
ALU_D,SC,ALU,R[3]_ALU ; R[3]=SC=155
=0 D 0,CALL,J/DC9
EALU/A,FEK/LOAD,ALU_K[.FFFF] ; FE=155
D D.LEFT,SI/7
=0 D D.LEFT,SI/ZERO,CALL,J/DC8
ALU_D,SC,ALU,R[4]_ALU ; R[4]=SC=268
EBMX/FE,EALU/NABS.A-B,SC,EALU ; TEST INSTR, SC=NABS(68-55)=NABS(13)=3ED
NOP
=0 D 0,CALL,J/DCF ; GENERATE THE EXPECTED RESULT
ALU_K[.FFFF]
D D.LEFT,SI/7
=0 D D.LEFT,SI/ZERO,CALL,J/DCD
ALU_D,RC[0E]_ALU,Q_ALU ; RESULT SHOULD BE 3ED
D SC,RC[0D]_ALU
ALU_Q-D,CLK_UBCC ; CHECK THE RESULT
Z?
=0 ERROR1 ; RESULT INCORRECT
NOP

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:3399
:3400
:3401
:3402
U 11DE, 0000,003D,0180,0800,0000,10B2
U 11DF, 0018,0038,0980,09F8,0000,13C0
U 13C0, 0F18,0038,1980,0A98,0082,11E0
U 11E0, 0000,003D,0180,0800,0100,1018
U 11E1, 0100,003C,0180,0800,0000,13C1
U 13C1, 0100,003C,0180,0800,0000,13C2
U 13C2, 0001,003C,0180,0AAB,0000,13C3
U 13C3, 0001,003C,0180,0AB0,0000,11E2
U 11E2, 0F00,003D,0180,0800,0000,101F
U 11E3, 0000,003C,0180,0800,0000,11E4
U 11E4, 0000,003D,0180,0800,0000,101F
U 11E5, 0001,0028,0180,0AA0,0000,11E6
U 11E6, 0F00,003D,0180,0800,0000,101C
U 11E7, 0100,003C,0180,0800,0000,11E8
U 11E8, 0100,003C,0180,0800,0000,11E9
U 11E9, 0100,003C,0180,0800,0000,13C4
U 13C4, 0001,003C,0180,0AB8,0000,11EA
U 11EA, 0000,003D,0180,0800,0000,111C
U 11EB, 0800,003C,0180,0A18,0082,13C5
U 13C5, 0000,003C,01C0,0A20,0080,F3C6
U 13C6, 081F,2000,0180,0800,0000,13C7
U 13C7, 081D,0024,0180,0A38,0000,13C8
U 13C8, 001C,2030,01C0,09F0,0000,13C9
U 13C9, 0818,0038,1D80,09E8,0000,13CA
U 13CA, 001D,2000,0180,0800,0010,13CB
U 13CB, 0000,013C,0180,0800,0000,11EC
U 11EC, 0000,003D,0180,0800,0000,111E
U 11ED, 0000,003C,0180,0800,0080,F3CC
U 13CC, 0818,0038,1D80,09E8,0000,13CD
U 13CD, 001D,2000,0180,0A18,0010,13CE
U 13CE, 0000,013C,0180,0800,0000,11EE
U 11EE, 0000,003D,0180,0800,0000,111E

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.PAGE "TEST 6E EALU/NABS.A-B ROM TEST"
*****
++
TEST 6E EALU/NABS.A-B ROM TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ROM USED TO COMPUTE THE NEGATIVE
ABSOLUTE VALUE OF THE A-B. EVERY LOCATION IN THIS
ROM IS TESTED.
NOTE THAT THIS TEST IS CONDUCTED BY SUBTRACTING
ZERO FROM THE OPERAND WHOSE NEGATIVE ABSOLUTE
VALUE IS TO BE TAKEN.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
GOT RESULT

--
*****
=0
ABS: NEWTST
RC[0F] K[.2]
ALU 0(R),R[3] ALU,SC,ALU,D 0 ; INITIALIZE SOME CONSTANTS
=0 EALU/A,FEK/LOAD,CALL,J/DC8 ; FE=80
D-D.LEFT2,SI/ZERO
D-D.LEFT2,SI/ZERO
R[5] D ; R[5]=80
R[6] D ; R[6]=80
=0 D 0,CALL,J/DCF
NOP
=0 CALL,J/DCF
ALU NOT.D,R[4]_ALU ; R[4]=FFFFFF00
=0 D 0,CALL,J/DCC
D-D.LEFT2,SI/ZERO
=0 D-D.LEFT2,SI/ZERO
D-D.LEFT2,SI/ZERO
R[7] D ; R[7]=300
=0 ERLOOP
ABS1: LAB R[3],AMX/LA,ALU/A,SC,ALU,D ALU ; LOAD POSITIVE DATA PATTERN INTO SC
EBMX/FE,EALU/NABS.A-B,SC,EALU,D R[4] ; TEST INSTR, EALU=NABS(0+POSITIVE DATA)
D 0-D ; COMPUTE EXPECTED RESULT
ALU DEANDNOT]Q,D,ALU,LAB_R[7]
ALU LA[OR]D,Q,ALU,RC[0E]_ALU
D SC,RC[0D]_ALU ; GET ACTUAL RESULT LEFT IN SC
ALU Q-D,CLK-UBCC ; CHECK THE RESULT
Z?
=0 ERROR1 ; RESULT INCORRECT WHEN NABS ROM
; SHOULD HAVE BEEN ENABLED
EBMX/FE,EALU/NABS.A-B,SC,EALU ; TEST INSTR, EALU=NABS(0+NEGATIVE DATA)
D SC,RC[0D]_ALU ; GET THE RESULT
ALU Q-D,CLK-UBCC,LAB_R[3] ; CHECK THE RESULT
Z?
=0 ERROR1 ; RESULT INCORRECT WHEN NABS ROM

```



```
U 11EF, 0018,0014,0580,0A98,0000,13CF :3403
U 13CF, 0000,003C,0180,0A28,0000,13D0 :3404
U 13D0, 0018,0000,0580,0AA8,0010,13D1 :3405
U 13D1, 0000,013C,0180,0800,0000,11F0 :3406
U 11F0, 0000,003C,0180,0800,0000,11EB :3407
U 11F1, 0000,003C,0180,0800,0000,11F2 :3408
U 11F2, 0000,003D,0180,0800,0000,10B2 :3409
                                     :3410
                                     :3411
```

R[3]_LA+K[.1] ; SHOULD NOT HAVE BEEN ENABLED
LAB R[5]
R[5]_LA-K[.1],CLK.UBCC ; TRIED ALL PATTERNS?
Z?
J/ABS1 ; IF NOT CONTINUE
NOP
=0
=0
DUMMY1: NEWTSI

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1871=	1838	1839	2241=	1845=	1861=	1840	2242=
U 1008	1862=	1863=	1972=	1973=	1841	2244=	1842	2245=
U 1010	1953=	1954=	1955=	1956=	1957=	1958=	1959=	1960=
U 1018	1961=	1962=	1963=	1964=	1965=	1966=	1967=	1968=
U 1020	2001=	2002=	2003=	2004=	2005=	2006=	2007=	2008=
U 1028	2009=	2010=	2011=	2012=	2013=	2014=	2015=	2016=
U 1030	2046=	2047=	2048=	2049=	2050=	2051=	2052=	2053=
U 1038	2054=	2055=	2056=	2057=	2058=	2059=	2060=	2061=
U 1040	1975=	1976=	1843	2247=	2018=	2019=	1844	2248=
U 1048	2022=	2023=	2034=	2035=	1864	2286=	1902=	2287=
U 1050	2120=	2121=	2123=	2124=	1865	2250=	1866	2251=
U 1058	2126=	2127=	1905=	2289=	2131=	2132=	1908=	2290=
U 1060	2064=	2065=	2066=	2067=	2068=	2069=	2070=	2071=
U 1068	2072=	2073=	2074=	2075=	2076=	2077=	2078=	2079=
U 1070	2083=	2084=	2085=	2086=	2087=	2088=	2089=	2090=
U 1078	2091=	2092=	2093=	2094=	2095=	2096=	2097=	2098=
U 1080	2101=	2102=	2103=	2104=	2105=	2106=	2107=	2108=
U 1088	2109=	2110=	2111=	2112=	2113=	2114=	2115=	2116=
U 1090	3282=	3283=	3284=	3285=	3286=	3287=	3288=	1867
U 1098	2134=	2135=	2137=	2138=	2163=	2164=	2253=	2254=
U 10A0	3293=	3294=	3295=	3296=	3297=	3298=	3299=	1868
U 10A8	2166=	2167=	1869	2346=	2169=	2170=	1870	2347=
U 10B0	2171=	2172=	1880	2349=	2177=	2178=	1881	2350=
U 10B8	2190=	2191=	2201=	2202=	1882	2357=	1883	2358=
U 10C0	2207=	2208=	2236=	2237=	1884	2360=	1885	2361=
U 10C8	2238=	2239=	2279=	2280=	2283=	2284=	2367=	2368=
U 10D0	2292=	2294=	2320=	2321=	2323=	2324=	2370=	2371=
U 10D8	2325=	2326=	2327=	2328=	1886	3110=	1887	3113=
U 10E0	2329=	2330=	2331=	2332=	1888	3131=	1889	3134=
U 10E8	2334=	2335=	2336=	2337=	1890	3152=	1891	3155=
U 10F0	2339=	2340=	2344=	2345=	1892	3173=	1893	3176=
U 10F8	2354=	2355=	2365=	2366=	1894	3194=	1895	3197=
U 1100	1825=	1826=	1827=	1828=	1829=	1830=	1831=	1832=
U 1108	1833=	1896	2374=	2375=	1834=	1835=	1836=	1837=
U 1110	2395=	2396=	2398=	2399=	1897	3217=	1898	3220=
U 1118	2401=	2402=	2407=	2408=	1899	3240=	1900	3243=
U 1120	2410=	2411=	2432=	2433=	2434=	2435=	2438=	2439=
U 1128	2446=	2447=	2454=	2455=	2458=	2459=	2487=	2488=
U 1130	2495=	2496=	2498=	2499=	2502=	2503=	2512=	2513=
U 1138	2524=	2525=	2546=	2547=	2551=	2552=	2563=	2564=
U 1140	2584=	2585=	2588=	2589=	2615=	2616=	2619=	2620=
U 1148	2622=	2623=	2630=	2631=	2638=	2639=	2642=	2643=
U 1150	2665=	2666=	2669=	2670=	1901	1928=	2672=	2673=
U 1158	2680=	2681=	2688=	2689=	2692=	2693=	2716=	2717=
U 1160	2720=	2721=	2723=	2724=	2730=	2731=	2737=	2738=
U 1168	2741=	2742=	2764=	2765=	2768=	2769=	2771=	2772=
U 1170	2779=	2780=	2787=	2788=	2791=	2792=	2813=	2814=
U 1178	2817=	2818=	2820=	2821=	2828=	2830=	2837=	2838=
U 1180	2841=	2842=	2864=	2865=	2870=	2871=	2881=	2882=
U 1188	2892=	2893=	2896=	2897=	2926=	2927=	2931=	2932=
U 1190	2943=	2944=	2957=	2958=	2961=	2962=	3008=	3009=
U 1198	3013=	3014=	3017=	3018=	3028=	3032=	3034=	3035=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3039=	3040=	3054=	3056=	3058=	3059=	3064=	3065=
U 11A8	3070=	3071=	3081=	3083=	3085=	3086=	3091=	3092=
U 11B0	3097=	3100=	3107=	3108=	3120=	3121=	3128=	3129=
U 11B8	3141=	3142=	3149=	3150=	3162=	3163=	3170=	3171=
U 11C0	3183=	3184=	3191=	3192=	3206=	3207=	3214=	3215=
U 11C8	3229=	3230=	3237=	3238=	3250=	3251=	3323=	3324=
U 11D0	3326=	3327=	3329=	3330=	3331=	3332=	3334=	3335=
U 11D8	3338=	3339=	3341=	3342=	3346=	3347=	3370=	3371=
U 11E0	3373=	3374=	3378=	3379=	3380=	3381=	3382=	3383=
U 11E8	3384=	3385=	3387=	3388=	3396=	3398=	3402=	3404=
U 11F0	3408=	3409=	3411=	1903	1904	1936	1937	1943
U 11F8	1944	1945	1948	1949	1950	1951	1969	1970
U 1200	1974	1977	1978	1979	1980	1981	1982	1983
U 1208	1984	1985	1986	1987	1988	1989	1990	1991
U 1210	1992	1993	1994	1995	1996	2017	2024	2025
U 1218	2026	2027	2028	2029	2030	2031	2036	2037
U 1220	2038	2039	2040	2041	2042	2043	2125	2136
U 1228	2165	2168	2173	2174	2175	2176	2179	2180
U 1230	2185	2186	2187	2188	2189	2193	2194	2196
U 1238	2197	2198	2199	2200	2203	2204	2205	2206
U 1240	2240	2243	2246	2249	2252	2255	2281	2282
U 1248	2285	2288	2291	2322	2333	2338	2341	2342
U 1250	2343	2351	2352	2353	2362	2363	2364	2372
U 1258	2373	2397	2400	2403	2405	2406	2409	2436
U 1260	2437	2440	2441	2442	2443	2444	2445	2448
U 1268	2449	2450	2451	2452	2453	2456	2457	2460
U 1270	2461	2462	2463	2489	2490	2491	2492	2493
U 1278	2494	2497	2500	2501	2504	2505	2506	2507
U 1280	2508	2509	2510	2511	2514	2515	2516	2517
U 1288	2518	2519	2520	2521	2522	2523	2526	2527
U 1290	2528	2529	2530	2531	2532	2533	2534	2535
U 1298	2536	2537	2538	2539	2540	2541	2542	2543
U 12A0	2544	2545	2548	2549	2550	2562	2565	2566
U 12A8	2567	2568	1929:	2569	2570	2571	2572	2573
U 12B0	2580	2581	2582	2583	2586	2587	2590	2591
U 12B8	2592	2617	2618	2621	2624	2625	2626	2627
U 12C0	2628	2629	2632	2633	2634	2635	2636	2637
U 12C8	2640	2641	2644	2645	2667	2668	2671	2674
U 12D0	2675	2676	2677	2678	2679	2682	2683	2684
U 12D8	2685	2686	2687	2690	2691	2694	2695	2718
U 12E0	2719	2722	2725	2726	2727	2728	2729	2732
U 12E8	2733	2734	2735	2736	2739	2740	2743	2744
U 12F0	2766	2767	2770	2773	2774	2775	2776	2777
U 12F8	2778	2781	2782	2783	2784	2785	2786	2789
U 1300	2790	2793	2794	2815	2816	2819	2822	2824
U 1308	2825	2826	2827	2831	2833	2834	2835	2836
U 1310	2839	2840	2843	2844	2866	2867	2868	2869
U 1318	2872	2873	2875	2876	2877	2878	2879	2880
U 1320	2883	2884	2886	2887	2888	2889	2890	2891
U 1328	2894	2895	2898	2899	2900	2901	2928	2929
U 1330	2930	2934	2935	2939	2940	2941	2942	2945
U 1338	2946	2952	2953	2954	2955	2956	2959	2960
U 1340	2963	2964	3010	3011	3015	3016	3019	3020

Line Number Index

ESKAH23.MCR

MICRO2

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3022	3023	3024	3025	3026	3027	3033	3036
U 1350	3037	3038	3041	3043	3044	3045	3046	3047
U 1358	3048	3049	3050	3051	3052	3053	3057	3060
U 1360	3061	3062	3063	3066	3067	3069	3072	3073
U 1368	3074	3075	3076	3077	3078	3079	3080	3084
U 1370	3087	3088	3089	3090	3093	3094	3095	3109
U 1378	3114	3115	3116	3117	3118	3119	3130	3135
U 1380	3136	3137	3138	3139	3140	3151	3156	3157
U 1388	3158	3159	3160	3161	3172	3177	3178	3179
U 1390	3180	3181	3182	3193	3198	3199	3200	3201
U 1398	3202	3203	3204	3205	3216	3221	3222	3223
U 13A0	3224	3225	3226	3227	3228	3239	3244	3245
U 13A8	3246	3247	3248	3249	3269	3270	3271	3272
U 13B0	3273	3274	3275	3276	3277	3278	3301	3325
U 13B8	3328	3333	3336	3337	3340	3343	3344	3345
U 13C0	3372	3375	3376	3377	3386	3389	3390	3391
U 13C8	3392	3393	3394	3395	3399	3400	3401	3405
U 13D0	3406	3407						
U 13D8 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:


```
Total microwords used in memory U: 994
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

N 3

MICROC2 1M(01)

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SEO 0241
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ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH23.MIC

```
Pass 1 warnings: 0    Pass 2 warnings: 0
Pass 1 errors: 0    Pass 2 errors: 0
```

[illegible]

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2139	TEST 6F QK/DECIMAL.CONSTANT TEST 1
: 2190	TEST 70 QK/DECIMAL.CONSTANT TEST 2
: 2238	TEST 71 LOAD OR SHIFT D CONDITIONAL FUNCTION TEST
: 2289	TEST 72 SHIFT VALUE INPUT TO THE DAL TEST
: 2347	TEST 73 SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST
: 2418	TEST 74 USI TEST USING THE SHF MUX
: 2654	TEST 75 SIGN CONTROL AND BEN SS (SIGN SOURCE) TEST
: 2833	TEST 76 BMX/PACKED.FL TEST
: 2880	TEST 77 BEN ALU.N TEST
: 2983	TEST 78 WRITE RAB WITH DT/BYTE TEST
: 3034	TEST 79 WRITE RAB WITH DT/WORD TEST
: 3085	TEST 7A SC AS ADDRESS SOURCE FOR RC REGISTERS TEST
: 3154	TEST 7B RA AND RB ADDRESSED BY SC TEST
: 3224	TEST 7C LA_RA[0-7] TEST

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C 4

ZZ
ES

```

;1          .NOLIST
;1804       .LIST
;1805

```



```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      +
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814      :
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN.
:1819      :
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823      :
:1824      :
:1825      1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
:1826      1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
:1827      1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
:1828      1103: SC_K[.3],J/TRPH0      : TB MODIFY
:1829      1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
:1830      1105: SC_K[.6],J/TRPH0      : TB MISS
:1831      1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
:1832      1107: SC_K[.7],J/TRPH0      : TB PARITY
:1833      1108: SC_K[.8],J/TRPH0      : CACHE PARITY
:1834      110C: SC_K[.C],J/TRPH1      : RDS
:1835      110D: SC_K[.D],J/TRPH1      : TIME OUT
:1836      110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
:1837      110F: SC_K[.F],J/TRPH1     : CS PARITY
:1838      TRPH0: Q_ID[USTACK]
:1839      : Q_D,D,Q
:1840      : ID[USTACK]_D
:1841      : Q_D,D,Q
:1842      : Q-R[OF]
:1843      : ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
:1844      : Z?                                ; BRANCH IF NO
:1845      : =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
:1846      : +
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850      :
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      : -

```

```

U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,1046
U 1046, 0C00,003C,01E0,0800,0000,1056
U 1056, 0000,003C,8180,3C00,0000,105B
U 105B, 0C00,003C,01E0,0800,0000,1109
U 1109, 0000,003C,01C0,0A78,0000,1154
U 1154, 0001,2024,0180,0800,0010,11E1
U 11E1, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

```

U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,7207 :1862
U 1005, 0000,003C,49F0,2C00,0000,11E2 :1863
U 11E2, 0001,203C,4DF0,2DB0,0000,11E3 :1864
U 11E3, 0001,203C,65F0,2DB8,0000,11E4 :1865
U 11E4, 0001,203C,6DF0,2DD8,0000,11E5 :1866
U 11E5, 0001,203C,75F0,2DE0,0000,11E6 :1867
U 11E6, 0001,203C,79F0,2DC8,0000,11E7 :1868
U 11E7, 0001,203C,69F0,2DC0,0000,11E8 :1869
U 11E8, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1201 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 11E9, 0000,003C,65F8,0800,0084,71EA :1880
U 11EA, 0818,0038,8D80,0800,0000,11EB :1881
U 11EB, 0D00,003C,0180,0800,0000,11EC :1882
U 11EC, 0000,003C,3D80,3C00,0000,11ED :1883
U 11ED, 0818,0038,0580,0800,0000,11F0 :1884
U 11F0, 0D00,003C,0180,0800,0000,11F1 :1885
U 11F1, 0F00,003C,3180,3C00,0000,11F2 :1886
U 11F2, 0000,003C,5D80,3C00,0000,11F3 :1887
U 11F3, 0000,003C,3980,3C00,0000,11F4 :1888
U 11F4, 0000,003C,2980,3C00,0000,11F5 :1889
U 11F5, 0000,003C,4980,3C00,0000,11F6 :1890
U 11F6, 0818,0038,C180,0800,0000,11F7 :1891
U 11F7, 0000,003C,6580,3C00,0000,11F8 :1892
U 11F8, 0F00,003C,6D80,3C00,0000,11F9 :1893
U 11F9, 0000,003C,6D80,3C00,0000,11FA :1894
U 11FA, 0000,003C,6580,3C00,0000,11FB :1895
U 11FB, 0003,003C,0180,09F0,0000,11FC :1896
U 11FC, 0003,003C,0180,0AF8,0000,11FD :1897
U 11FD, 0003,003C,0180,09E8,0000,105E :1898
U 1200, 0818,0038,0980,0800,0000,105E :1899
U 1201, 0810,0038,0180,0978,0000,1202 :1900
U 1202, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 1203, 0810,0038,0180,0978,0000,1204 :1903
U 1204, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905
:1906
:1907
U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

:+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWTST
ERLOOP
ERROR1
ERROR2

SCOPE: SC_K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_K[.1F] : ...
D_DAL.SC :
ID[PSL]_D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D_DAL.SC :
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.[S]]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.[S]]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0E] 0
RC[0F] 0
RC[0D] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

:+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,1205 :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 1205, 0810,0038,4D80,0978,0000,1206 :1936
U 1206, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 1207, 0010,0038,01C0,0978,0000,1208 :1943
U 1208, 0019,2034,4DC0,0800,0000,1209 :1944
U 1209, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
U 120A, 0118,0038,1B80,0800,0000,1210 :1948
U 120B, 0118,0038,0B80,0800,0000,1210 :1949
U 120C, 0118,0038,0780,0800,0000,1210 :1950
U 120D, 0118,0038,C380,0800,0000,1210 :1951
:1952
U 1010, 0018,0038,1980,0800,0000,120A :1953
U 1011, 0018,0038,1980,0800,0000,120B :1954
U 1012, 0018,0038,1980,0800,0000,120C :1955
U 1013, 0018,0038,1980,0800,0000,120D :1956
U 1014, 0018,0038,0980,0800,0000,120A :1957
U 1015, 0018,0038,0980,0800,0000,120B :1958
U 1016, 0018,0038,0980,0800,0000,120C :1959
U 1017, 0018,0038,0980,0800,0000,120D :1960
U 1018, 0018,0038,0580,0800,0000,120A :1961
U 1019, 0018,0038,0580,0800,0000,120B :1962
U 101A, 0018,0038,0580,0800,0000,120C :1963
U 101B, 0018,0038,0580,0800,0000,120D :1964
U 101C, 0018,0038,C180,0800,0000,120A :1965
U 101D, 0018,0038,C180,0800,0000,120B :1966
U 101E, 0018,0038,C180,0800,0000,120C :1967
U 101F, 0018,0038,C180,0800,0000,120D :1968
U 1210, 0100,003E,0380,0800,0000,0001 :1969
U 1211, 0018,0038,01C0,0800,0000,1006 :1970

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

:+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:-

SUBTST: D RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1

:+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:-

SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D D.LEFT2,SI/7,J/SX
=0000
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D D.LEFT2,SI/7,RETURN1
DC.6: Q_K[.8]

U 1006.	0000.	003D.	0180.	0800.	0000.	1016	: 1971
U 1007.	0019.	2000.	05C0.	0800.	0010.	1212	: 1972
U 1212.	0000.	013C.	0180.	0800.	0000.	1008	: 1973
U 1008.	0000.	003C.	0180.	0800.	0000.	1006	: 1974
U 1009.	0000.	003E.	0180.	0800.	0000.	0001	: 1975
U 1213.	0018.	0038.	0580.	0800.	0000.	1214	: 1976
U 1214.	0118.	0038.	0780.	0800.	0000.	1215	: 1977
U 1215.	0118.	0038.	0780.	0800.	0000.	1216	: 1978
U 1216.	0118.	0038.	0780.	0800.	0000.	1217	: 1979
U 1217.	0118.	0038.	0780.	0800.	0000.	1218	: 1980
U 1218.	0118.	0038.	0780.	0800.	0000.	1219	: 1981
U 1219.	0118.	0038.	0780.	0800.	0000.	121A	: 1982
U 121A.	0118.	0038.	0780.	0800.	0000.	121B	: 1983
U 121B.	0100.	003E.	0380.	0800.	0000.	0001	: 1984
U 121C.	0018.	0038.	0980.	0800.	0000.	121D	: 1985
U 121D.	0218.	0038.	0B80.	0800.	0000.	1220	: 1986
U 1220.	0218.	0038.	0B80.	0800.	0000.	1221	: 1987
U 1221.	0218.	0038.	0B80.	0800.	0000.	1222	: 1988
U 1222.	0218.	0038.	0B80.	0800.	0000.	1223	: 1989
U 1223.	0218.	0038.	0B80.	0800.	0000.	1224	: 1990
U 1224.	0218.	0038.	0B80.	0800.	0000.	1225	: 1991
U 1225.	0218.	0038.	0B80.	0800.	0000.	1226	: 1992
U 1226.	0200.	003E.	0380.	0800.	0000.	0001	: 1993
U 1227.	0F00.	003C.	0180.	0800.	0000.	1228	: 1994
U 1228.	0819.	0000.	0580.	0800.	0000.	1010	: 1995
							: 1996

U 1020.	0019.	2000.	05C0.	0800.	0000.	1021	:2001
U 1021.	0019.	2000.	05C0.	0800.	0000.	1022	:2002
U 1022.	0019.	2000.	05C0.	0800.	0000.	1023	:2003
U 1023.	0019.	2000.	05C0.	0800.	0000.	1024	:2004
U 1024.	0019.	2000.	05C0.	0800.	0000.	1025	:2005
U 1025.	0019.	2000.	05C0.	0800.	0000.	1026	:2006
U 1026.	0019.	2000.	05C0.	0800.	0000.	1027	:2007
U 1027.	0019.	2000.	05C0.	0800.	0000.	1028	:2008
U 1028.	0019.	2000.	05C0.	0800.	0000.	1029	:2009
U 1029.	0019.	2000.	05C0.	0800.	0000.	102A	:2010
U 102A.	0019.	2000.	05C0.	0800.	0000.	102B	:2011
U 102B.	0019.	2000.	05C0.	0800.	0000.	102C	:2012
U 102C.	0019.	2000.	05C0.	0800.	0000.	102D	:2013
U 102D.	0019.	2000.	05C0.	0800.	0000.	102E	:2014
U 102E.	0019.	2000.	05C0.	0800.	0000.	102F	:2015
U 102F.	0001.	203C.	0180.	0800.	0010.	1229	:2016
U 1229.	001D.	2114.	01C0.	0800.	0000.	100A	:2017
U 100A.	0000.	003E.	0180.	0800.	0000.	0001	:2018
U 100B.	0000.	003E.	0180.	0800.	0000.	0002	:2019
							:2020
							:2021
U 100C.	0000.	003D.	0180.	0800.	0000.	122A	:2022
U 100D.	0000.	003C.	0180.	0800.	0000.	122A	:2023
U 122A.	0000.	003C.	01A8.	0800.	0000.	122B	:2024
U 122B.	0000.	003C.	01A8.	0800.	0000.	122C	:2025

[illegible]

```

; THIS TABLE IS USED AS A TARGET TO TEST BRANCHES.
; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.

```

```

-0000
BRTBLE: Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
BRT1:   Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
BRT2:   Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        Q_Q-K[.1]
        ALU Q,CLK,UBCC
        Z?,ALU Q+D,Q_ALU
=0      RETURN
        RETURN2

```

RETURN
; THESE SUBROUTINES ARE USED TO SHIFT ZEROS INTO THE Q REGISTER.

```

SHQLFT16:      CALL J/SHQLFT8
               J/SHQLFT8
SHQLFT8:      Q-Q.LEFT,SI/3
SHQLFT7:      Q-Q.LEFT,SI/3

```


U 122C. 0000,003C,01A8,0800,0000,122D :2026
U 122D. 0000,003C,01A8,0800,0000,1230 :2027
U 1230. 0000,003C,01A8,0800,0000,1231 :2028
U 1231. 0000,003C,01A8,0800,0000,1232 :2029
U 1232. 0000,003C,01A8,0800,0000,1233 :2030
U 1233. 0000,003E,01A8,0800,0000,0001 :2031

Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3
Q-Q.LEFT,SI/3,RETURN1
: THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
=0

U 1040. 0000,003D,0180,0800,0000,1234 :2034
U 1041. 0000,003C,0180,0800,0000,1234 :2035
U 1234. 0000,003C,03A8,0800,0000,1235 :2036
U 1235. 0000,003C,03A8,0800,0000,1236 :2037
U 1236. 0000,003C,03A8,0800,0000,1237 :2038
U 1237. 0000,003C,03A8,0800,0000,1238 :2039
U 1238. 0000,003C,03A8,0800,0000,1239 :2040
U 1239. 0000,003C,03A8,0800,0000,123A :2041
U 123A. 0000,003C,03A8,0800,0000,123B :2042
U 123B. 0000,003E,03A8,0800,0000,0001 :2043

SHQL16: CALL,J/SHQL8
J/SHQL8
SHQL8: Q-Q.LEFT,SI/7
SHQL7: Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7
Q-Q.LEFT,SI/7,RETURN1
: THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
=0000

U 1030. 0001,203E,0180,0A80,0000,0001 :2046
U 1031. 0001,203E,0180,0A88,0000,0001 :2047
U 1032. 0001,203E,0180,0A90,0000,0001 :2048
U 1033. 0001,203E,0180,0A98,0000,0001 :2049
U 1034. 0001,203E,0180,0AA0,0000,0001 :2050
U 1035. 0001,203E,0180,0AA8,0000,0001 :2051
U 1036. 0001,203E,0180,0AB0,0000,0001 :2052
U 1037. 0001,203E,0180,0AB8,0000,0001 :2053
U 1038. 0001,203E,0180,0AC0,0000,0001 :2054
U 1039. 0001,203E,0180,0AC8,0000,0001 :2055
U 103A. 0001,203E,0180,0AD0,0000,0001 :2056
U 103B. 0001,203E,0180,0AD8,0000,0001 :2057
U 103C. 0001,203E,0180,0AE0,0000,0001 :2058
U 103D. 0001,203E,0180,0AE8,0000,0001 :2059
U 103E. 0001,203E,0180,0AF0,0000,0001 :2060
U 103F. 0001,203E,0180,0AF8,0000,0001 :2061

WRRARB: R[0]-Q,RETURN1
R[1]-Q,RETURN1
R[2]-Q,RETURN1
R[3]-Q,RETURN1
R[4]-Q,RETURN1
R[5]-Q,RETURN1
R[6]-Q,RETURN1
R[7]-Q,RETURN1
R[8]-Q,RETURN1
R[9]-Q,RETURN1
R[0A]-Q,RETURN1
R[0B]-Q,RETURN1
R[0C]-Q,RETURN1
R[0D]-Q,RETURN1
R[0E]-Q,RETURN1
R[0F]-Q,RETURN1
: THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
=0000

U 1060. 0001,203E,0180,0980,0000,0001 :2064
U 1061. 0001,203E,0180,0988,0000,0001 :2065
U 1062. 0001,203E,0180,0990,0000,0001 :2066
U 1063. 0001,203E,0180,0998,0000,0001 :2067
U 1064. 0001,203E,0180,09A0,0000,0001 :2068
U 1065. 0001,203E,0180,09A8,0000,0001 :2069
U 1066. 0001,203E,0180,09B0,0000,0001 :2070
U 1067. 0001,203E,0180,09B8,0000,0001 :2071
U 1068. 0001,203E,0180,09C0,0000,0001 :2072
U 1069. 0001,203E,0180,09C8,0000,0001 :2073
U 106A. 0001,203E,0180,09D0,0000,0001 :2074
U 106B. 0001,203E,0180,09D8,0000,0001 :2075
U 106C. 0001,203E,0180,09E0,0000,0001 :2076
U 106D. 0001,203E,0180,09E8,0000,0001 :2077
U 106E. 0001,203E,0180,09F0,0000,0001 :2078
U 106F. 0001,203E,0180,09F8,0000,0001 :2079

WRRRC: RC[0]-Q,RETURN1
RC[1]-Q,RETURN1
RC[2]-Q,RETURN1
RC[3]-Q,RETURN1
RC[4]-Q,RETURN1
RC[5]-Q,RETURN1
RC[6]-Q,RETURN1
RC[7]-Q,RETURN1
RC[8]-Q,RETURN1
RC[9]-Q,RETURN1
RC[0A]-Q,RETURN1
RC[0B]-Q,RETURN1
RC[0C]-Q,RETURN1
RC[0D]-Q,RETURN1
RC[0E]-Q,RETURN1
RC[0F]-Q,RETURN1
: THESE ARE USED TO READ THE RA AND RB SCRATCH PADS

:2080

```

:2081 ; INTO LA AND LB.
:2082 =0000
:2083 LTCHAB: LAB_R[0],RETURN1
:2084 LAB_R[1],RETURN1
:2085 LAB_R[2],RETURN1
:2086 LAB_R[3],RETURN1
:2087 LAB_R[4],RETURN1
:2088 LAB_R[5],RETURN1
:2089 LAB_R[6],RETURN1
:2090 LAB_R[7],RETURN1
:2091 LAB_R[8],RETURN1
:2092 LAB_R[9],RETURN1
:2093 LAB_R[0A],RETURN1
:2094 LAB_R[0B],RETURN1
:2095 LAB_R[0C],RETURN1
:2096 LAB_R[0D],RETURN1
:2097 LAB_R[0E],RETURN1
:2098 LAB_R[0F],RETURN1
:2099 ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
:2100 =0000
:2101 LTCHRC: LC_RC[0],RETURN1
:2102 LC_RC[1],RETURN1
:2103 LC_RC[2],RETURN1
:2104 LC_RC[3],RETURN1
:2105 LC_RC[4],RETURN1
:2106 LC_RC[5],RETURN1
:2107 LC_RC[6],RETURN1
:2108 LC_RC[7],RETURN1
:2109 LC_RC[8],RETURN1
:2110 LC_RC[9],RETURN1
:2111 LC_RC[0A],RETURN1
:2112 LC_RC[0B],RETURN1
:2113 LC_RC[0C],RETURN1
:2114 LC_RC[0D],RETURN1
:2115 LC_RC[0E],RETURN1
:2116 LC_RC[0F],RETURN1
:2117 ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
:2118 ; CONTENTS OF Q.
:2119 =0
:2120 RARB.Q: D 0,CALL,J/DC.NF
:2121 NOP
:2122 =0
:2123 RARB.QA: CALL,D3-0?,J/WRRARB
:2124 D D+K[.1],CLK.UBCC
:2125 Z?
:2126 =0 J/RARB.QA
:2127 RETURN1
:2128 ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
:2129 ; CONTENTS OF Q.
:2130 =0
:2131 RC.Q: D 0,CALL,J/DC.NF
:2132 NOP
:2133 =0
:2134 RC.QA: CALL,D3-0?,J/WRRC
:2135 D D+K[.1],CLK.UBCC

U 1070, 0000,003E,0180,0A00,0000,0001
U 1071, 0000,003E,0180,0A08,0000,0001
U 1072, 0000,003E,0180,0A10,0000,0001
U 1073, 0000,003E,0180,0A18,0000,0001
U 1074, 0000,003E,0180,0A20,0000,0001
U 1075, 0000,003E,0180,0A28,0000,0001
U 1076, 0000,003E,0180,0A30,0000,0001
U 1077, 0000,003E,0180,0A38,0000,0001
U 1078, 0000,003E,0180,0A40,0000,0001
U 1079, 0000,003E,0180,0A48,0000,0001
U 107A, 0000,003E,0180,0A50,0000,0001
U 107B, 0000,003E,0180,0A58,0000,0001
U 107C, 0000,003E,0180,0A60,0000,0001
U 107D, 0000,003E,0180,0A68,0000,0001
U 107E, 0000,003E,0180,0A70,0000,0001
U 107F, 0000,003E,0180,0A78,0000,0001

U 1080, 0000,003E,0180,0900,0000,0001
U 1081, 0000,003E,0180,0908,0000,0001
U 1082, 0000,003E,0180,0910,0000,0001
U 1083, 0000,003E,0180,0918,0000,0001
U 1084, 0000,003E,0180,0920,0000,0001
U 1085, 0000,003E,0180,0928,0000,0001
U 1086, 0000,003E,0180,0930,0000,0001
U 1087, 0000,003E,0180,0938,0000,0001
U 1088, 0000,003E,0180,0940,0000,0001
U 1089, 0000,003E,0180,0948,0000,0001
U 108A, 0000,003E,0180,0950,0000,0001
U 108B, 0000,003E,0180,0958,0000,0001
U 108C, 0000,003E,0180,0960,0000,0001
U 108D, 0000,003E,0180,0968,0000,0001
U 108E, 0000,003E,0180,0970,0000,0001
U 108F, 0000,003E,0180,0978,0000,0001

U 1042, 0F00,003D,0180,0800,0000,1227
U 1043, 0000,003C,0180,0800,0000,1044

U 1044, 0000,193D,0180,0800,0000,1030
U 1045, 0819,0014,0580,0800,0010,123C
U 123C, 0000,013C,0180,0800,0000,1048
U 1048, 0000,003C,0180,0800,0000,1044
U 1049, 0000,003E,0180,0800,0000,0001

U 104A, 0F00,003D,0180,0800,0000,1227
U 104B, 0000,003C,0180,0800,0000,104C

U 104C, 0000,193D,0180,0800,0000,1060
U 104D, 0819,0014,0580,0800,0010,123D

```

J 4

16-DEC-82 10:59:52

ZZ
ES
$$= 0$$

Z?
J/RC.QA
RETURN1

```

:2139 .PAGE "TEST 6F QK/DECIMAL.CONSTANT TEST 1"
:2140 *****
:2141 ++
:2142 TEST 6F QK/DECIMAL.CONSTANT TEST 1
:2143
:2144 TEST DESCRIPTION
:2145 THIS IS A TEST OF THE UQK FUNCTION WHICH CONTROLS
:2146 THE GENERATION OF A DECIMAL CONSTANT IN THE Q
:2147 REGISTER.
:2148 THESE CONSTANTS ARE GENERATED:
:2149 66666660
:2150 66666606
:2151 66666066
:2152 ...ETC. THROUGH
:2153 06666666
:2154
:2155 LOGIC DESCRIPTION
:2156
:2157 ERROR DESCRIPTION
:2158
:2159 EXPECTED RESULT
:2160 ACTUAL RESULT
:2161
:2162 --
:2163 *****
:2164 =0
:2165 QDC1: NEWTST
:2166 ALU_Q-K[.1],D,ALU
:2167 ALU_D[ANDNOT]R[.F],D,ALU
:2168 R[4]_D ; R[4]=FFFFFFF0
:2169 =0 D_0,CALL,J/DC.6
:2170 R[5]_D ; R[5]=66666666
:2171 R[3]_K[.7] ; R[3]=7
:2172 =0 ERLOOP
:2173 QDC1A: LAB_R[4],D,LA
:2174 ALU_LA[A+B]LB,QK/DEC.CON ; TEST INSTRUCTION
:2175 LAB_R[5],ALU_LA[ANDNOT]D,D,ALU ; GENERATE EXPECTED RESULT.
:2176 RC[OF]_K[.2] ; SAVE GOT AND EXPECTED DATA
:2177 RC[OE]_D ; IN CASE OF ERROR.
:2178 RC[OD]_Q
:2179 ALU_Q-D,CLK,UBCC
:2180 Z?
:2181 =0 ERROR1 ; INCORRECT DECIMAL CONSTANT.
:2182 ALU_R[3],CLK,UBCC
:2183 Z?
:2184 =0 R[3]_LA-K[.1],J/QDC1B
:2185 J/QDC1C
:2186 =0
:2187 QDC1B: D_R[4],CALL,J/DCF
:2188 R[4]_D,J/QDC1A
:2189 QDC1C: NOP

```

U 1052. 0000,003D,0180,0800,0000,11E9
U 1053. 081B,0000,0580,0800,0000,1240
U 1240. 0819,0024,6180,0800,0000,1241
U 1241. 0001,003C,0180,0AA0,0000,1054
U 1054. 0F00,003D,0180,0800,0000,1211
U 1055. 0001,003C,0180,0AAB,0000,1242
U 1242. 0018,0038,5D80,0A98,0000,1058
U 1058. 0000,003D,0180,0800,0000,1200
U 1059. 0800,003C,0180,0A20,0000,1243
U 1243. 000C,0014,01D0,0800,0000,1244
U 1244. 081C,2024,0180,0A28,0000,1245
U 1245. 0018,0038,0980,09F8,0000,1246
U 1246. 0001,003C,0180,09F0,0000,1247
U 1247. 0001,203C,0180,09E8,0000,1248
U 1248. 001D,2000,0180,0800,0010,1249
U 1249. 0000,013C,0180,0800,0000,105C
U 105C. 0000,003D,0180,0800,0000,1201
U 105D. 0000,003C,0180,0A18,0010,124A
U 124A. 0000,013C,0180,0800,0000,1090
U 1090. 0018,0000,0580,0A98,0000,1092
U 1091. 0000,003C,0180,0800,0000,124B

U 1092. 0800,003D,0180,0A20,0000,101F
U 1093. 0001,003C,0180,0AA0,0000,1059
U 124B. 0000,003C,0180,0800,0000,1094


```

:2190
:2191
:2192
:2193
:2194
:2195
:2196
:2197
:2198
:2199
:2200
:2201
:2202
:2203
:2204
:2205
:2206
:2207
:2208
:2209
:2210
:2211
:2212
:2213
:2214
:2215
:2216
:2217
:2218
:2219
:2220
:2221
:2222
:2223
:2224
:2225
:2226
:2227
:2228
:2229
:2230
:2231
:2232
:2233
:2234
:2235
:2236
:2237
U 1094, 0000,003D,0180,0800,0000,11E9
U 1095, 0018,0038,6180,0AA0,0000,1096
U 1096, 0F00,003D,0180,0800,0000,1211
U 1097, 0001,003C,0180,0AA8,0000,124C
U 124C, 0018,0038,5D80,0A98,0000,1098
U 1098, 0000,003D,0180,0800,0000,1200
U 1099, 0800,003C,0180,0A20,0000,124D
U 124D, 000C,0014,01D0,0800,0000,1250
U 1250, 081C,2024,0180,0A28,0000,1251
U 1251, 0018,0038,0980,09F8,0000,1252
U 1252, 0001,003C,0180,09F0,0000,1253
U 1253, 0001,203C,0180,09E8,0000,1254
U 1254, 001D,2000,0180,0800,0010,1255
U 1255, 0000,013C,0180,0800,0000,109A
U 109A, 0000,003D,0180,0800,0000,1201
U 109B, 0000,003C,0180,0A18,0010,1256
U 1256, 0000,013C,0180,0800,0000,109C
U 109C, 0018,0000,0580,0A98,0000,10A0
U 109D, 0000,003C,0180,0800,0000,1258
U 10A0, 0800,003D,0180,0A20,0000,101F
U 10A1, 0001,003C,0180,0AA0,0000,1099
U 1258, 0000,003C,0180,0800,0000,10A2

```

.PAGE 'TEST 70 QK/DECIMAL.CONSTANT TEST 2'

++
TEST 70 QK/DECIMAL.CONSTANT TEST 2

TEST DESCRIPTION
THIS IS A TEST OF THE UQK FUNCTION WHICH CONTROLS
THE GENERATION OF A DECIMAL CONSTANT IN THE Q
REGISTER.
THESE CONSTANTS ARE GENERATED:
00000006
00000060
00000600
...ETC. THROUGH
60000000

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--

```

=0
QDC2: NEWTST
      R[4],K[F]          : R[4]=0000000F
=0    D 0,CALL,J/DC.6
      R[5],D            : R[5]=66666666
      R[3],K[7]          : R[3]=7
=0    ERLOOP
QDC2A: LAB R[4],D,LA
      ALU_LA[A+B],LB,QK/DEC.CON ; TEST INSTRUCTION
      LAB R[5],ALU_LA[ANDNOT]D,D,ALU ; GENERATE EXPECTED RESULT.
      RC[0F],K[2]          : SAVE GOT AND EXPECTED DATA
      RC[0E],D            : IN CASE OF ERROR.
      RC[0D],Q
      ALU_Q-D,CLK,UBCC
      Z?
=0    ERROR1             : INCORRECT DECIMAL CONSTANT.
      ALU_R[3],CLK,UBCC
      Z?
=0    R[3],LA-K[1],J/QDC2B
      J/QDC2C
=0
QDC2B: D R[4],CALL,J/DCF
      R[4],D,J/QDC2A
QDC2C: NOP

```

```

:2238
:2239
:2240
:2241
:2242
:2243
:2244
:2245
:2246
:2247
:2248
:2249
:2250
:2251
:2252
:2253
:2254
:2255
:2256
:2257
:2258
:2259
:2260
:2261
:2262
:2263
:2264
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:2275
:2276
:2277
:2278
:2279
:2280
:2281
:2282
:2283
:2284
:2285
:2286
:2287
:2288
U 10A2, 0000,003D,0180,0800,0000,11E9
U 10A3, 0F18,0038,C180,0800,0000,1259
U 1259, 0600,003C,0380,0800,0000,125A
U 125A, 0018,0038,0980,09F8,0000,125B
U 125B, 0001,003C,0180,0A88,0000,10A4
U 10A4, 0000,003D,0180,0800,0000,1213
U 10A5, 0000,003C,0180,0800,0000,10A6
U 10A6, 0000,003D,0180,0800,0000,1213
U 10A7, 0001,003C,0180,0A90,0000,10A8
U 10A8, 0000,003D,0180,0800,0000,1211
U 10A9, 0001,003C,0180,0A98,0000,125C
U 125C, 0500,003C,0180,0800,0000,125D
U 125D, 0001,003C,01E0,09F0,0000,125E
U 125E, 0800,003C,0180,0A18,0000,1260
U 1260, 0418,0014,1980,0A10,0000,1261
U 1261, 0001,003C,0180,09E8,0000,1262
U 1262, 001D,2000,0180,0800,0010,1263
U 1263, 0000,013C,0180,0800,0000,10AA
U 10AA, 0000,003D,0180,0800,0000,1201
U 10AB, 0000,003C,0180,0800,0000,10AC
U 10AC, 0000,003D,0180,0800,0000,1200
U 10AD, 0800,003C,0180,0A18,0000,1264
U 1264, 0000,003C,01C0,0A08,0000,1265
U 1265, 0000,003C,0180,0A10,0000,1266
U 1266, 041C,0014,01C0,09F0,0000,1268
U 1268, 0001,003C,0180,09E8,0000,1269
U 1269, 001D,2000,0180,0800,0010,126A
U 126A, 0000,013C,0180,0800,0000,10B0
U 10B0, 0000,003D,0180,0800,0000,1201
U 10B1, 0000,003C,0180,0800,0000,10B2
    
```

```

.PAGE 'TEST 71 LOAD OR SHIFT D CONDITIONAL FUNCTION TEST'
*****
++
TEST 71 LOAD OR SHIFT D CONDITIONAL FUNCTION TEST
TEST DESCRIPTION
THIS IS A TEST OF THE UDK FUNCTION WHICH CONDITIONALLY
LOADS OR SHIFTS THE D REGISTER.
IF NOT ALU CARRY 31 SHIFT LEFT, ELSE LOAD FROM SHF MUX.
LOGIC DESCRIPTION
ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT
--
*****
=0
DK10: NEWTST
      D_0,ALU_K[FFFF] ; GENERATE SOME CONSTANTS
      D-D.RIGHT,S1/7 ; NEEDED TO PERFORM THE TEST
      RC[0F]_K[2]
      R[1]_D ; R[1]=80000000
=0 CALL,J/DCAAAA
      NOP
=0 CALL,J/DCAAAA
      R[2]_D ; R[2]=AAAAAAAA
=0 CALL,J/DC.6
      R[3]_D ; R[3]=66666666
      D-D.[EFT,S1/3
      RC[0E]_D,Q_D
      D_R[3]
      ; TEST INSTRUCTION
      LAB_R[2],AMX/LA,K[ZERO],BMX/KMX,ALU/A+B,SHF/ALU,DK/DIV
      RC[0D]_D
      ALU_Q-D,CLK.UBCC
      Z?
=0 ERROR1 ; FAILED WITH ALU CARRY 31 = 0
      NOP
=0 ERLOOP
      D_R[3]
      Q_R[1]
      LAB_R[2]
      ; TEST INSTRUCTION:
      ALU_LA[A+B]Q,RC[0E]_ALU,DK/DIV,Q_ALU
      RC[0D]_D
      ALU_Q-D,CLK.UBCC
      Z?
=0 ERROR1 ; FAILED WITH ALU CARRY 31 = 1
      NOP
    
```

```

.PAGE      "TEST 72"      SHIFT VALUE INPUT TO THE DAL TEST"
*****
++
TEST 72      SHIFT VALUE INPUTS TO THE DAL TEST

TEST DESCRIPTION
THIS IS A TEST OF THE SHIFT VALUE LOGIC AND ITS INPUTS
TO THE DAL SHIFTER.
TEST DATA PATTERNS ARE GENERATED IN THE SAME SEQUENCE
USED IN THE PREVIOUS TEST, (SEE ABOVE TEST DESCRIPTION).

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--
*****
=0
SVB:  NEWTST
      R[1]_K[.1F]          ; SET UP SOME COUNTERS.
      R[2]_K[.1F]
      RC[0F]_K[.3]

SVB1:  LAB_R[2]
      R[3]_LA-K[.1]

=0
SVB2:  ERLOOP
      SC_R[2]              ; SET THE MOST SIGNIFICANT
      ALU_NOT.MASK,D_ALU   ; BIT OF THE OPERAND
      SC_R[3]              ; SET THE LEAST SIGNIFICANT
      ALU_D.ORNOT.MASK,D_ALU,RC[0C]_ALU ; BIT OF THE OPERAND
      Q_R[2]               ; COMPUTE EXPECTED RESULT
      LAB_R[1]
      ALU_LA[A-B]Q,R[5]_ALU
      R[4]_D
      SC_R[5],Q_0
      D_DAL.SC
      RC[0E]_D
      Q_0,SC_K[ZERO]
      D_R[4]
      D_DAL.NORM          ; TEST INSTRUCTION
      RC[0D]_D
      Q_RC[0E]
      A[U_Q-D,CLK.UBCC    ; RESULT CORRECT?
      Z?

=0
ERROR1
ALU_R[3],CLK.UBCC
Z?

=0
R[3]_LA-K[.1],J/SVB2
ALU_R[2],CLK.UBCC
Z?

=0
J/SVB3
J/SVB4
SVB3: R[2]_LA-K[.1],CLK.UBCC
      Z?

```

ZZ-ESKAH-V132 TEST 72 SHIFT VALUE INPUT TO THE DAL TEST B 5
ESKAH24.MCR MICRO2 1M(01) 16-DEC-82 10:59:52

SEQ 0255
Page 6

ZZ
ES

U 10BC, 0000,003C,0180,0800,0000,126D ;2344 =0 J/SVB1
U 10BD, 0003,003C,0180,0A98,0000,10B5 ;2345 R[3]_0,J/SVB2
U 1288, 0000,003C,0180,0800,0000,10C0 ;2346 SVB4: NOP

CC
CCCCCCCC
CCCCCCCC
CCC


```

:2347
:2348
:2349
:2350
:2351
:2352
:2353
:2354
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:2356
:2357
:2358
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:2360
:2361
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:2394
:2395
:2396
:2397
:2398
:2399
:2400
:2401
    
```

```

.PAGE "TEST 73 SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST"
*****
++
TEST 73 SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST

TEST DESCRIPTION
THIS IS A TEST OF THE SHIFT VALUE LOGIC WHICH
DETERMINES THE AMOUNT THAT D NEED BE SHIFTED IN
ORDER TO BE NORMALIZED. THIS VALUE IS CHECKED
BY REFERNCING IT THROUGH THE EBMX OF THE EXPONENT SECTION.
TEST DATA USED FOLLOWS THE PATTERN:
    C0000000
    A0000000
    90000000
    88000000
    ...THROUGH
    80000001
    60000000
    50000000
    48000000
    ...THROUGH
    40000001
    30000000
    ...ETC. THROUGH
    00000003
    00000001

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT
D OPERAND

--
*****
=0
SVA: NEWTST
      R[1]_K[.1F] ; SET UP SOME COUNTERS.
      R[2]_K[.1F]
SVA1: LAB_R[2]
      R[3]_LA-K[.1]
=0
SVA2: SC_R[2] ; SET THE MOST SIGNIFICANT
      ALU_NOT.MASK,D_ALU ; BIT OF THE OPERAND
      SC_R[3] ; SET THE LEAST SIGNIFICANT
      ALU_D.ORNOT.MASK,D_ALU,R[0C]_ALU ; BIT OF THE OPERAND
      Q_R[2]
      LAB_R[1]
      ALU_LA[A-B]Q,R[5]_ALU ; COMPUTE EXPECTED RESULT.
      EBMX/SHF.VAL,EALU7B,SC_EALU ; TEST INSTRUCTION
      Q_SC ; GET THE RESULT
      R[0F]_K[.3]
      LAB_R[5]
      R[0E]_LA
    
```

```

U 10C0, 0000,003D,0180,0800,0000,11E9
U 10C1, 0016,0038,8D80,0A88,0000,1289
U 1289, 0018,0038,8D80,0A90,0000,128A
U 128A, 0000,003C,0180,0A10,0000,128B
U 128B, 0018,0000,0580,0A98,0000,10C2
U 10C2, 0000,003D,0180,0800,0000,1200
U 10C3, 0000,003C,0180,0A10,0082,128C
U 128C, 0803,001C,0180,0800,0000,128D
U 128D, 0000,003C,0180,0A18,0082,128E
U 128E, 0801,001C,0180,09E0,0000,1290
U 1290, 0000,003C,01C0,0A10,0000,1291
U 1291, 0000,003C,0180,0A08,0000,1292
U 1292, 001C,0000,0180,0AA8,0000,1293
U 1293, 0000,003C,0180,0300,008C,7294
U 1294, 0018,0038,1DC0,0800,0000,1295
U 1295, 0018,0038,0D80,09F8,0000,1296
U 1296, 0000,003C,0180,0A28,0000,1297
U 1297, 0000,003C,0180,09F0,0000,12A0
    
```

Address	Instruction	Comment
U 12A0.	0001,203C,0180,09E8,0000,12A1	:2402 RC[0D] Q
U 12A1.	001C,0000,0180,0800,0010,12A2	:2403 ALU_LA[A-B]Q,CLK.UBCC ; RESULT CORRECT?
U 12A2.	0000,013C,0180,0800,0000,10C4	:2404 Z?
U 10C4.	0000,003D,0180,0800,0000,1201	:2405 =0 ERROR1 ; REPORT FAILURE.
U 10C5.	0000,003C,0180,0A18,0010,12A3	:2406 ALU_R[3],CLK.UBCC
U 12A3.	0000,013C,0180,0800,0000,10C6	:2407 Z?
U 10C6.	0018,0000,0580,0A98,0000,10C3	:2408 =0 R[3]_LA-K[.1],J/SVA2
U 10C7.	0000,003C,0180,0A10,0010,12A4	:2409 ALU_R[2],CLK.UBCC
U 12A4.	0000,013C,0180,0800,0000,10C8	:2410 Z?
U 10C8.	0000,003C,0180,0800,0000,12A5	:2411 =0 J/SVA3
U 10C9.	0000,003C,0180,0800,0000,12A7	:2412 J/SVA4
U 12A5.	0018,0000,0580,0A90,0010,12A6	:2413 SVA3: R[2]_LA-K[.1],CLK.UBCC
U 12A6.	0000,013C,0180,0800,0000,10CA	:2414 Z?
U 10CA.	0000,003C,0180,0800,0000,128A	:2415 =0 J/SVA1
U 10CB.	0003,003C,0180,0A98,0000,10C3	:2416 R[3]_0,J/SVA2
U 12A7.	0000,003C,0180,0800,0000,10CC	:2417 SVA4: NOP

U 10CC.	0000,003D,0180,0800,0000,11E9
U 10CD.	0F00,003C,0180,0800,0000,10D0
U 10D0.	0000,003D,0180,0800,0000,1213
U 10D1.	0000,003C,0180,0800,0000,10D2
U 10D2.	0000,003D,0180,0800,0000,1213
U 10D3.	0001,003C,0180,0A98,0000,12A8
U 12A8.	0500,003C,0180,0800,0000,12A9
U 12A9.	0600,003C,0180,0800,0000,12AB
U 12AB.	0001,003C,0180,0A90,0000,12AC
U 12AC.	0018,0038,0980,09F8,0000,12AD
U 12AD.	0500,003C,0180,0800,0000,12AE
U 12AE.	0001,003C,0180,0AA0,0000,12AF
U 12AF.	0800,003C,0180,0A18,0000,12B0
U 12B0.	0018,0038,0180,0800,0000,12B1
U 12B1.	0500,003C,0380,0800,0000,12B2
U 12B2.	0001,003C,0180,0AA8,0000,10D4

U 10D4.	0000,003D,0180,0800,0000,1205
U 10D5.	0000,003C,0180,0800,0000,10D6
U 10D6.	0000,003D,0180,0800,0000,1200
U 10D7.	0F00,003C,0180,0800,0000,12B3
U 12B3.	0000,003C,3D80,3C00,0000,12B4
U 12B4.	0820,003C,0000,0A10,0000,12B5
U 12B5.	0001,003C,0180,09E8,0000,12B6
U 12B6.	0000,003C,01C0,0A20,0000,12B7
U 12B7.	0001,203C,0180,09F0,0000,12B8
U 12B8.	001D,2000,0180,0800,0010,12B9
U 12B9.	0000,013C,0180,0800,0000,10D8
U 10D8.	0000,003D,0180,0800,0000,1201
U 10D9.	0000,003C,0180,0800,0000,10DA

[illegible]

```

U 10DA, 0000,003D,0180,0800,0000,1205
U 10DB, 0000,003C,0180,0800,0000,10DC
U 10DC, 0000,003D,0180,0800,0000,1200
U 10DD, 0818,0038,0180,0800,0000,12BA
U 12BA, 0000,003C,3D80,3C00,0000,12BB
U 12BB, 0820,003C,0000,0A10,0000,12BC
U 12BC, 0001,003C,0180,09E8,0000,12BD
U 12BD, 0000,003C,01C0,0A28,0000,12BE
U 12BE, 0001,203C,0180,09F0,0000,12BF
U 12BF, 001D,2000,0180,0800,0010,12C0
U 12C0, 0000,013C,0180,0800,0000,10E0
U 10E0, 0000,003D,0180,0800,0000,1201
U 10E1, 0000,003C,0180,0800,0000,10E2

U 10E2, 0000,003D,0180,0800,0000,1205
U 10E3, 0000,003C,0180,0800,0000,10E4
U 10E4, 0000,003D,0180,0800,0000,1200
U 10E5, 0840,003C,0080,0A10,0000,12C1
U 12C1, 0001,003C,0180,09E8,0000,12C2
U 12C2, 0000,003C,01C0,0A10,0000,12C3
U 12C3, 0000,003C,0180,0800,0000,12C4
U 12C4, 0001,203C,0180,09F0,0000,12C5
U 12C5, 001D,2000,0180,0800,0010,12C6
U 12C6, 0000,013C,0180,0800,0000,10E6
U 10E6, 0000,003D,0180,0800,0000,1201
U 10E7, 0000,003C,0180,0800,0000,10E8

U 10E8, 0000,003D,0180,0800,0000,1205
U 10E9, 0000,003C,0180,0800,0000,10EA
U 10EA, 0000,003D,0180,0800,0000,1200
U 10EB, 0840,003C,0080,0A18,0000,12C7
U 12C7, 0001,003C,0180,09E8,0000,12C8
U 12C8, 0000,003C,01C0,0A18,0000,12C9
U 12C9, 0000,003C,0380,0800,0000,12CA
U 12CA, 0001,203C,0180,09F0,0000,12CB
U 12CB, 001D,2000,0180,0800,0010,12CC
U 12CC, 0000,013C,0180,0800,0000,10EC
U 10EC, 0000,003D,0180,0800,0000,1201
U 10ED, 0000,003C,0180,0800,0000,10F0

U 10F0, 0000,003D,0180,0800,0000,1205

```



```

NOP
=0 ERLOOP
    ALU_R[2],SHF/RIGHT2,SI/1,DK/SHF ; TEST INSTRUCTION
    RC[0D]_D
    Q_R[2] ; GET EXPECTED RESULT
    Q_Q.RIGHT2,SI/ZERO
    RC[0E]_Q
    ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
    Z?
=0 ERROR1
    NOP

```

```

+-----+
+ SUBTEST      6
+ SI=1, SHIFT RIGHT2, ALU 31=1
+-----+

```

```

=0      SUBTEST
        NOP
=0      ERLOOP
        ALU R[3],SHF/RIGHT2,SI/1,DK/SHF ; TEST INSTRUCTION
        RC[0D]_D
        Q_R[3] ; GET THE EXPECTED RESULT
        Q-Q.RIGHT2,SI/7
        RC[0E]_Q
        ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
        Z?
=0      ERROR1
        NOP

```

SUBTEST 7
 SI=2

```

=0      SUBTEST
        NOP
=0      ERLOOP
        ALU_R[3],SHF/LEFT,SI/2,DK/SHF ; TEST INSTRUCTION
        RC[0D]_D
        Q_R[4]_Q ; GET EXPECTED RESULT
        RC[0E]_Q
        ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
        Z?
=0      ERROR1
        NOP

```

SUBTEST 8
 SI=3

```

=0      SUBTEST
        NOP
=0      ERLOOP
        ALU_R[3],SHF/LEFT,S1/3,DK/SHF ; TEST INSTRUCTION
        RC[0D]_D
        Q_R[4] ; GET EXPECTED RESULT

```

```

U 12E0. 0001,203C,0180,09F0,0000,12E1 :2583      RC[OE] Q
U 12E1. 001D,2000,0180,0800,0010,12E2 :2584      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 12E2. 0000,013C,0180,0800,0000,1116 :2585      Z?
U 1116. 0000,003D,0180,0800,0000,1201 :2586      =0      ERROR1
U 1117. 0000,003C,0180,0800,0000,1118 :2587      NOP
:2588      ;////////////////////////////////////
:2589      +
:2590      SUBTEST          9
:2591      SI=5, Q31=0
:2592      -
U 1118. 0000,003D,0180,0800,0000,1205 :2593      =0      SUBTEST
U 1119. 0000,003C,0180,0800,0000,111A :2594      NOP
U 111A. 0000,003D,0180,0800,0000,1200 :2595      =0      ERLOOP
U 111B. 0000,003C,01F8,0800,0000,12E3 :2596      Q 0      ; CLEAR Q<31>
U 12E3. 0820,003C,0280,0A18,0000,12E4 :2597      ALU_R[3],SHF/LEFT,SI/5,DK/SHF ; TEST INSTRUCTION
U 12E4. 0001,003C,0180,09E8,0000,12E5 :2598      RC[0D]_D
U 12E5. 0000,003C,01C0,0A20,0000,12E6 :2599      Q_R[4]      ; GET EXPECTED RESULT
U 12E6. 0001,203C,0180,09F0,0000,12E7 :2600      RC[OE] Q
U 12E7. 001D,2000,0180,0800,0010,12E8 :2601      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 12E8. 0000,013C,0180,0800,0000,111C :2602      Z?
U 111C. 0000,003D,0180,0800,0000,1201 :2603      =0      ERROR1
U 111D. 0000,003C,0180,0800,0000,1120 :2604      NOP
:2605      ;////////////////////////////////////
:2606      +
:2607      SUBTEST          A
:2608      SI=5, Q31=1
:2609      -
U 1120. 0000,003D,0180,0800,0000,1205 :2610      =0      SUBTEST
U 1121. 0000,003C,0180,0800,0000,1122 :2611      NOP
U 1122. 0000,003D,0180,0800,0000,1200 :2612      =0      ERLOOP
U 1123. 0000,003C,01C0,0A18,0000,12E9 :2613      Q_R[3]      ; SET Q<31>
U 12E9. 0820,003C,0280,0A18,0000,12EA :2614      ALU_R[3],SHF/LEFT,SI/5,DK/SHF ; TEST INSTRUCTION
U 12EA. 0001,003C,0180,09E8,0000,12EB :2615      RC[0D]_D
U 12EB. 0000,003C,01C0,0A28,0000,12EC :2616      Q_R[5]      ; GET EXPECTED RESULT
U 12EC. 0001,203C,0180,09F0,0000,12ED :2617      RC[OE] Q
U 12ED. 001D,2000,0180,0800,0010,12EE :2618      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 12EE. 0000,013C,0180,0800,0000,1124 :2619      Z?
U 1124. 0000,003D,0180,0800,0000,1201 :2620      =0      ERROR1
U 1125. 0000,003C,0180,0800,0000,1126 :2621      NOP
:2622      ;////////////////////////////////////
:2623      +
:2624      SUBTEST          B
:2625      SI=6
:2626      -
U 1126. 0000,003D,0180,0800,0000,1205 :2627      =0      SUBTEST
U 1127. 0000,003C,0180,0800,0000,1128 :2628      NOP
U 1128. 0000,003D,0180,0800,0000,1200 :2629      =0      ERLOOP
U 1129. 0820,003C,0300,0A18,0000,12EF :2630      ALU_R[3],SHF/LEFT,SI/6,DK/SHF ; TEST INSTRUCTION
U 12EF. 0001,003C,0180,09E8,0000,12F0 :2631      RC[0D]_D
U 12F0. 0000,003C,01C0,0A20,0000,12F1 :2632      Q_R[4]      ; GET THE EXPECTED RESULT
U 12F1. 0001,203C,0180,09F0,0000,12F2 :2633      RC[OE] Q
U 12F2. 001D,2000,0180,0800,0010,12F3 :2634      ALU_Q-D,CLK.UBCC      ; RESULT CORRECT?
U 12F3. 0000,013C,0180,0800,0000,112A :2635      Z?
U 112A. 0000,003D,0180,0800,0000,1201 :2636      =0      ERROR1
U 112B. 0000,003C,0180,0800,0000,112C :2637      NOP

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SEQ 0262
Page 6

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U 112C, 0000,003D,0180,0800,0000,1205
U 112D, 0000,003C,0180,0800,0000,1130
U 1130, 0000,003D,0180,0800,0000,1200
U 1131, 0820,003C,0380,0A18,0000,12F4
U 12F4, 0001,003C,0180,09E8,0000,12F5
U 12F5, 0000,003C,01C0,0A28,0000,12F6
U 12F6, 0001,203C,0180,09F0,0000,12F7
U 12F7, 001D,2000,0180,0800,0010,12F8
U 12F8, 0000,013C,0180,0800,0000,1132
U 1132, 0000,003D,0180,0800,0000,1201
U 1133, 0000,003C,0180,0800,0000,1134

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ES

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:2654 .PAGE 'TEST 75 SIGN CONTROL AND BEN SS (SIGN SOURCE ) TEST'
:2655 *****
:2656 ++
:2657 TEST 75 SIGN CONTROL AND BEN SS (SIGN SOURCE ) TEST
:2658
:2659 TEST DESCRIPTION:
:2660 THIS IS A TEST OF THE USGN FIELD. A ZERO AND A ONE
:2661 ARE PRESENTED AT EACH OF THE INPUTS TO SS AND SD MUXES, AND
:2662 THE BRANCH LOGIC IS USED TO CHECK THE RESULT. SS INPUT D6
:2663 IS TESTED IN SECTION 37.
:2664
:2665 LOGIC DESCRIPTION
:2666
:2667 ERROR DESCRIPTION
:2668 ERROR CODE:
:2669 0 => BRANCH FAILED TO BE DEASSERTED
:2670 1 => BRANCH FAILED TO BE ASSERTED
:2671 2 => NOT A BRANCH LOGIC FAILURE
:2672
:2673 --
:2674 *****
:2675 =0
:2676 SSTE: NEWTST
:2677 RC[OE]_K[.1]
:2678 //////////////////////////////////////
:2679 +
:2680 SUBTEST 1
:2681
:2682 SGN/7,SGN/3,SGN/2,BEN SS TEST
:2683
:2684 =0
:2685 SS0: SUBTEST
:2686 RC[OE]_0 ;ERROR FLAG FOR BEN DEASSERTED
:2687 =0 ERLOOP
:2688 SGN/7 ; CLEAR BOTH
:2689 SS? ; SS CLEAR?
:2690 =1110 J/SS1
:2691 ERROR1 ; SS FAILED TO CLEAR OR BEN FAILED
:2692 SS1: SGN/2 ; SS_SD, CHECK TO SEE IF SD CLEARED
:2693 SS?
:2694 =1110 J/SS2
:2695 ERROR1 ; SD FAILED TO CLEAR OR BEN FAILED
:2696 SS2: SGN/3 ; SS_SS, SD_NOT_SD
:2697 SS? ; SS_SHOULD_STILL_BE_0
:2698 =1110 J/SS3
:2699 ERROR1 ; SGN/3 FAILED AT 0
:2700 SS3: RC[OE]_K[.1] ; ERROR FLAG FOR BEN ASSERTED
:2701 SGN/2 ; SEE IF SD WENT FROM 0->1 (SS_SD)
:2702 SS?
:2703 =1110 ERROR1 ; SGN/2,SGN/3,OR BEN FAILED
:2704 RC[OE]_K[.2] ; ERROR FLAG FOR BEN TESTED AT 0 AND 1
:2705 SGN/2 ; SEE IF SD STAYED AT 1 DURING LAST SGN/2
:2706 SS?
:2707 =1110 ERROR1 ; SD SGN/2 FAILED AT 1
:2708 SGN/3 ; SS_SS,SD_NOT_SD
    
```

U 1134, 0000,003D,0180,0800,0000,11E9
 U 1135, 0018,0038,0580,09F8,0000,1136

U 1136, 0000,003D,0180,0800,0000,1205
 U 1137, 0003,003C,0180,09F0,0000,1138
 U 1138, 0000,003D,0180,0800,0000,1200
 U 1139, 0000,003C,0187,0800,0000,12F9
 U 12F9, 0000,123C,0180,0800,0000,100E
 U 100E, 0000,003C,0180,0800,0000,12FA
 U 100F, 0000,003D,0180,0800,0000,1201
 U 12FA, 0000,003C,0182,0800,0000,12FB
 U 12FB, 0000,123C,0180,0800,0000,109E
 U 109E, 0000,003C,0180,0800,0000,12FC
 U 109F, 0000,003D,0180,0800,0000,1201
 U 12FC, 0000,003C,0183,0800,0000,12FD
 U 12FD, 0000,123C,0180,0800,0000,10AE
 U 10AE, 0000,003C,0180,0800,0000,12FE
 U 10AF, 0000,003D,0180,0800,0000,1201
 U 12FE, 0018,0038,0580,09F0,0000,12FF
 U 12FF, 0000,003C,0182,0800,0000,1300
 U 1300, 0000,123C,0180,0800,0000,10BE
 U 10BE, 0000,003D,0180,0800,0000,1201
 U 10BF, 0018,0038,0980,09F0,0000,1301
 U 1301, 0000,003C,0182,0800,0000,1302
 U 1302, 0000,123C,0180,0800,0000,10CE
 U 10CE, 0000,003D,0180,0800,0000,1201
 U 10CF, 0000,003C,0183,0800,0000,1303


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U 1303, 0000,123C,0180,0800,0000,10DE :2709
U 10DE, 0000,003D,0180,0800,0000,1201 :2710
U 10DF, 0000,003C,0182,0800,0000,1304 :2711
U 1304, 0000,123C,0180,0800,0000,10EE :2712
U 10EE, 0000,003C,0180,0800,0000,1305 :2713
U 10EF, 0000,003D,0180,0800,0000,1201 :2714
U 1305, 0000,003C,0182,0800,0000,10FE :2715
U 10FE, 0000,003C,0180,0800,0000,113A :2716
U 10FF, 0000,003D,0180,0800,0000,1201 :2717
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=1110 SS? : CHECK SS SGN/3 AT 1
ERROR1 : SS SGN/3 FAILED AT 1
SGN/2 : SEE IF SD WENT FROM 1 -> 0

=1110 J/SS4 : SD SGN/3 FROM 1 TO 0 FAILED
ERROR1 : SEE IF SD STAYED AT 0 DURING LAST SGN/2
SS4: SGN/2
=1110 J/SS5 : SD SGN/2 FAILED AT 0
ERROR1

:////////////////////
:
: SUBTEST 2
:
: SGN/0,SGN/1,SGN/4 TEST
:
:
:
:
SS5: SUBTEST
RC[OE]_KC.2] : ERROR FLAG FOR BEN TESTED
=0 ERLOOP
SGN/7 : CLEAR BOTH
SGN/0 : SS_SS, SD_SD
SS?
=1110 J/SS6
ERROR1 : SS SGN/0 FAILED AT 0
SS6: SGN/2 : SS_SD, CHECK SD
SS?
=1110 J/SS7
ERROR1 : SD SGN/0 FAILED AT 0
SS7: SGN/4 : SS_SS, SD_SS
SS?
=1110 J/SS8
ERROR1 : SS SGN/4 FAILED AT 0
SS8: SGN/2 : SEE IF SD GOT SS IN LAST SGN/4
SS?
=1110 J/SS9
ERROR1 : SD SGN/4 FAILED AT 0
SS9: SGN/3 : INVERT SD
SGN/2 : PUT IT IN SS
SGN/4 : SS_SS,SD_SS
SS?
=1110 ERROR1 : SS SGN/4 FAILED AT 1
SGN/3 : INVERT SD (NOW=0), SS STILL = 1
SGN/4
SGN/2
SS?
=1110 ERROR1 : SD SGN/4 FAILED AT 1
SGN/0 : SS_SS SHOULD STILL = 1
SS?
=1110 ERROR1 : SS SGN/0 FAILED AT 1
SGN/2 : SEE IF SD STAYED AT 1
SS?
=1110 ERROR1 : SD SGN/0 FAILED AT 1
SGN/1 : SD_SD
SGN/2
SS?

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U 119E, 0000,003D,0180,0800,0000,1201 :2764 =1110 ERROR1 ; SD SGN/0 FAILED AT 1
U 119F, 0000,003C,0183,0800,0000,1319 :2765 SGN/3 ; INVERT SD (NOW = 0)
U 1319, 0000,003C,0181,0800,0000,131A :2766 SGN/1
U 131A, 0000,003C,0182,0800,0000,131B :2767 SGN/2
U 131B, 0000,123C,0180,0800,0000,11AE :2768 SS?
U 11AE, 0000,003C,0180,0800,0000,1140 :2769 =1110 J/SS10
U 11AF, 0000,003D,0180,0800,0000,1201 :2770 ERROR1 ; SD SGN/1 FAILED AT 0
:2771 :////////////////////
:2772 :+
:2773 : SUBTEST 3
:2774 :
:2775 : ALU INPUTS TEST, SGN/1,SGN/5,SGN/6
:2776 :-
:2777 : =0
U 1140, 0000,003D,0180,0800,0000,1205 :2778 SS10: SUBTEST
U 1141, 0018,0038,0980,09F0,0000,1142 :2779 RC[OE]_K[.2] ; ERROR FLAG FOR BEN TESTED
U 1142, 0000,003D,0180,0800,0000,1200 :2780 =0 ERLOOP
U 1143, 0018,0038,1981,0800,0000,131C :2781 ALU_0(K),SGN/1 ; SS_ALU 15, SD_SD
U 131C, 0000,123C,0180,0800,0000,11BE :2782 SS?
U 11BE, 0000,003C,0180,0800,0000,131D :2783 =1110 J/SS11
U 11BF, 0000,003D,0180,0800,0000,1201 :2784 ERROR1 ; SS SGN/1 (ALU 15) FAILED AT 0
U 131D, 0018,0038,C181,0800,0000,131E :2785 SS11: ALU_K[.FFFF],SGN/1
U 131E, 0000,123C,0180,0800,0000,11CE :2786 SS?
U 11CE, 0000,003D,0180,0800,0000,1201 :2787 =1110 ERROR1 ; SS SGN/1 (ALU 15) FAILED AT 1
U 11CF, 0018,0038,1986,0800,0000,131F :2788 ALU_0(K),SGN/6 ; SD_ALU 15
U 131F, 0000,003C,0182,0800,0000,1320 :2789 SGN72 ; SS_SD
U 1320, 0000,123C,0180,0800,0000,11DE :2790 SS?
U 11DE, 0000,003C,0180,0800,0000,1321 :2791 =1110 J/SS12
U 11DF, 0000,003D,0180,0800,0000,1201 :2792 ERROR1 ; SD SGN/6 (ALU 15) FAILED AT 0
U 1321, 0018,0038,C186,0800,0000,1322 :2793 SS12: ALU_K[.FFFF],SGN/6
U 1322, 0000,003C,0182,0800,0000,1323 :2794 SGN72
U 1323, 0000,123C,0180,0800,0000,11EE :2795 SS?
U 11EE, 0000,003D,0180,0800,0000,1201 :2796 =1110 ERROR1 ; SD SGN/6 FAILED AT 1
U 11EF, 0018,0038,1985,0800,0000,1324 :2797 ALU_0(K),SGN/5 ; SD_ALU 15
U 1324, 0000,003C,0182,0800,0000,1325 :2798 SGN72
U 1325, 0000,123C,0180,0800,0000,11FE :2799 SS?
U 11FE, 0000,003C,0180,0800,0000,1326 :2800 =1110 J/SS13
U 11FF, 0000,003D,0180,0800,0000,1201 :2801 ERROR1 ; SD SGN/5 (ALU 15) FAILED AT 0
U 1326, 0018,0038,C185,0800,0000,1327 :2802 SS13: ALU_K[.FFFF],SGN/5 ;
U 1327, 0000,003C,0182,0800,0000,1328 :2803 SGN72
U 1328, 0000,123C,0180,0800,0000,120E :2804 SS?
U 120E, 0000,003D,0180,0800,0000,1201 :2805 =1110 ERROR1 ; SD SGN/5 (ALU 15) FAILED AT 1
U 120F, 0000,003C,0180,0800,0000,1144 :2806 NOP
:2807 :////////////////////
:2808 :+
:2809 : SUBTEST 4
:2810 :
:2811 : ALU 15 .XOR.SS (SGN/5) TEST
:2812 :-
:2813 : =0
U 1144, 0000,003D,0180,0800,0000,1205 :2814 SS14: SUBTEST
U 1145, 0018,0038,0980,09F0,0000,1146 :2815 RC[OE]_K[.2] ; ERROR FLAG FOR BEN TESTED
U 1146, 0000,003D,0180,0800,0000,1200 :2816 =0 ERLOOP
U 1147, 0000,003C,0187,0800,0000,1329 :2817 SGN/7 ; CLEAR BOTH
U 1329, 0018,0038,1985,0800,0000,132A :2818 ALU_0(K),SGN/5 ; TRY 00 TO XOR GATE
  
```

U 132A.	0000,123C,0180,0800,0000,121E	:2819	SS?
U 121E.	0000,003C,0180,0800,0000,132B	:2820	J/SS15
U 121F.	0000,003D,0180,0800,0000,1201	:2821	ERROR1
U 132B.	0018,0038,C185,0800,0000,132C	:2822	SS15: ALU_KC.FFFF],SGN/5 ; SS SGN/5 (ALU 15 .XOR.SS) FAILED, 00 IN
U 132C.	0000,123C,0180,0800,0000,122E	:2823	SS?
U 122E.	0000,003D,0180,0800,0000,1201	:2824	ERROR1 ; SGN/5 FAILED WITH 1 AND 0 INPUTS TO XOR
U 122F.	0018,0038,1985,0800,0000,132D	:2825	ALU_0(K),SGN/5 ; TRY 01 TO XOR GATE
U 132D.	0000,123C,0180,0800,0000,123E	:2826	SS?
U 123E.	0000,003D,0180,0800,0000,1201	:2827	ERROR1 ; SGN/5 FAILED WITH 0 AND 1 INPUTS TO XOR
U 123F.	0018,0038,C185,0800,0000,132E	:2828	ALU_KC.FFFF],SGN/5 ; TRY 11 TO XOR GATE
U 132E.	0000,123C,0180,0800,0000,124E	:2829	SS?
U 124E.	0000,003C,0180,0800,0000,132F	:2830	J/SSDONE
U 124F.	0000,003D,0180,0800,0000,1201	:2831	ERROR1 ; SGN/5 FAILED WITH 11 INPUTS TO XOR
U 132F.	0000,003C,0180,0800,0000,1148	:2832	SSDONE: NOP


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U 1156, 0000,003D,0180,0800,0000,11E9
U 1157, 0000,003C,0180,0800,0000,1158
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2900
2901
2902
2903
U 1158, 0000,003D,0180,0800,0000,1205
U 1159, 0000,003C,0180,0800,0000,115A
U 115A, 0000,003D,0180,0800,0000,1200
U 115B, 0000,003C,8D80,0800,0084,733D
U 133D, 0000,0038,0180,0800,0010,133E
U 133E, 0000,1B3C,0180,0800,0000,1047
U 1047, 0000,003C,0180,0800,0000,115C
U 104F, 0000,003D,0180,0800,0000,1201
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U 115C, 0000,003D,0180,0800,0000,1205
U 115D, 0000,003C,0180,0800,0000,1160
U 1160, 0000,003D,0180,0800,0000,1200
U 1161, 0000,003C,8D80,0800,0084,733F
U 133F, 0803,001C,0180,0800,0000,1340
U 1340, 0001,003C,0180,0800,0010,1341
U 1341, 0000,1B3C,0180,0800,0000,1057
U 1057, 0000,003D,0180,0800,0000,1201
U 105F, 0000,003C,0180,0800,0000,1162
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U 1162, 0000,003D,0180,0800,0000,1205
U 1163, 0000,003C,0180,0800,0000,1164
U 1164, 0000,003D,0180,0800,0000,1200
2934

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.PAGE "TEST 77 BEN ALU.N TEST"
*****
++
TEST 77 BEN ALU.N TEST

TEST DESCRIPTION
THIS IS A TEST OF THE UBRANCH CONDITION CODE BIT N.
IT IS TESTED IN EACH OF THE DATA TYPES: LONG,
WORD AND BYTE.

LOGIC DESCRIPTION

ERROR DESCRIPTION

--
*****
=0
NBIT: NEWTST
NOP
////////////////////////////////////
+
SUBTEST 1
TEST DT/LONG AND ALU<31>=0
-
=0 SUBTEST
NOP
=0 ERLOOP
SC K[.1F] ; USE MASK TO GET ALU=7FFFFFFF
ALD_MASK,CLK.UBCC,DT/LONG ; LOAD UBCC
ALU.N? ; TEST BEN.
=0111 J/NB1
ERROR1 ; TEST FAILED
////////////////////////////////////
+
SUBTEST 2
TEST DT/LONG AND ALU<31>=1
-
=0 NB1: SUBTEST
NOP
=0 ERLOOP
SC K[.1F] ; USE MASK TO GET DATA
ALD_NOT.MASK,D_ALU
ALU_D,CLK.UBCC,DT/LONG ; LOAD UBCC
ALU.N? ; TEST BEN ALU.N
=0111 ERROR1 ; REPORT FAILURE
NOP
////////////////////////////////////
+
SUBTEST 3
TEST DT/WORD AND ALU<15>=0
-
=0 SUBTEST
NOP
=0 ERLOOP

```

U 1165, 0000,003C,6180,0800,0084,7342 :2935
U 1342, 0000,4038,0180,0800,0010,1343 :2936
U 1343, 0000,1B3C,0180,0800,0000,1257 :2937
U 1257, 0000,003C,0180,0800,0000,1166 :2938
U 125F, 0000,003D,0180,0800,0000,1201 :2939

U 1166, 0000,003D,0180,0800,0000,1205 :2946
U 1167, 0000,003C,0180,0800,0000,1168 :2947
U 1168, 0000,003D,0180,0800,0000,1200 :2948
U 1169, 0000,003C,6180,0800,0084,7344 :2949
U 1344, 0803,001C,0180,0800,0000,1345 :2950
U 1345, 0001,403C,0180,0800,0010,1346 :2951
U 1346, 0000,1B3C,0180,0800,0000,1267 :2952
U 1267, 0000,003D,0180,0800,0000,1201 :2953
U 126F, 0000,003C,0180,0800,0000,116A :2954

U 116A, 0000,003D,0180,0800,0000,1205 :2960
U 116B, 0000,003C,0180,0800,0000,116C :2961
U 116C, 0000,003D,0180,0800,0000,1200 :2962
U 116D, 0000,003C,5D80,0800,0084,7347 :2963
U 1347, 0000,8038,0180,0800,0010,1348 :2964
U 1348, 0000,1B3C,0180,0800,0000,1277 :2965
U 1277, 0000,003C,0180,0800,0000,1170 :2966
U 127F, 0000,003D,0180,0800,0000,1201 :2967

U 1170, 0000,003D,0180,0800,0000,1205 :2974
U 1171, 0000,003C,0180,0800,0000,1172 :2975
U 1172, 0000,003D,0180,0800,0000,1200 :2976
U 1173, 0000,003C,5D80,0800,0084,7349 :2977
U 1349, 0803,001C,0180,0800,0000,134A :2978
U 134A, 0001,803C,0180,0800,0010,134B :2979
U 134B, 0000,1B3C,0180,0800,0000,1287 :2980
U 1287, 0000,003D,0180,0800,0000,1201 :2981
U 128F, 0000,003C,0180,0800,0000,1174 :2982

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SC K[F] ; USE MASK TO GENERATE DATA
ALD_MASK,CLK.UBCC,DT/WORD ; LOAD UBCC
ALU.N? ; TEST BEN ALU.N
=0111 J/NB2
ERROR1 ; REPORT ERROR
;////////////////////////////////////
;+
; SUBTEST 4
; TEST DT/WORD AND ALU<15>=1
;-
=0
NB2: SUBTEST
NOP
ERLOOP
=0 SC K[F] ; USE MASK TO GENERATE DATA
ALD_NOT.MASK,D_ALU ; LOAD UBCC
ALU_D,CLK.UBCC,DT/WORD ; TEST BEN ALU.N
ALU.N? ; REPORT ERRCR
=0111 ERROR1
NOP
;////////////////////////////////////
;+
; SUBTEST 5
; TEST DT/BYTE AND ALU<7>=0
;-
=0 SUBTEST
NOP
ERLOOP
=0 SC K[.7] ; USE THE MASK TO GENERATE THE DATA
ALD_MASK,CLK.UBCC,DT/BYTE ; LOAD UBCC
ALU.N? ; TEST BEN ALU.N
=0111 J/NB3
ERROR1 ; REPORT THE ERROR
;////////////////////////////////////
;+
; SUBTEST 6
; TEST DT/BYTE AND ALU<7>=1
;-
=0
NB3: SUBTEST
NOP
ERLOOP
=0 SC K[.7] ; USE MASK TO GENERATE THE DATA
ALD_NOT.MASK,D_ALU ; LOAD UBCC
ALU_D,CLK.UBCC,DT/BYTE ; TEST BEN ALU.N
ALU.N? ; REPORT ERROR
=0111 ERROR1
NOP

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:2983
:2984
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:2987
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:2989
:2990
:2991
:2992
:2993
:2994
:2995
:2996
:2997
:2998
:2999
:3000
:3001
:3002
:3003
:3004
:3005
:3006
:3007
:3008
:3009
:3010
:3011
:3012
:3013
:3014
:3015
:3016
:3017
:3018
:3019
:3020
:3021
:3022
:3023
:3024
:3025
:3026
:3027
:3028
:3029
:3030
:3031
:3032
:3033
U 1174, 0000,003D,0180,0800,0000,11E9
U 1175, 0018,0038,0980,09F8,0000,134C
U 134C, 001B,0000,0580,0A80,0000,134D
U 134D, 0018,8038,1980,0A80,0000,134E
U 134E, 001B,001C,49C0,09F0,0000,134F
U 134F, 0800,003C,0180,0A00,0000,1350
U 1350, 0001,003C,0180,09E8,0000,1351
U 1351, 001D,2000,0180,0800,0010,1352
U 1352, 0000,013C,0180,0800,0000,1176
U 1176, 0000,003D,0180,0800,0000,1201
U 1177, 080C,0038,0180,0800,0000,1353
U 1353, 0001,003C,0180,09E8,0000,1354
U 1354, 001D,2000,0180,0800,0010,1355
U 1355, 0000,013C,0180,0800,0000,1178
U 1178, 0000,003D,0180,0800,0000,1201
U 1179, 0000,003C,0180,0800,0000,117A
U 117A, 0000,003D,0180,0800,0000,1200
U 117B, 0018,0038,49C0,09F0,0000,1356
U 1356, 0003,003C,0180,0A80,0000,1357
U 1357, 081B,0000,0580,0800,0000,1358
U 1358, 0001,803C,0180,0A80,0000,1359
U 1359, 0800,003C,0180,0A00,0000,135A
U 135A, 0001,003C,0180,09E8,0000,135B
U 135B, 001D,2000,0180,0800,0010,135C
U 135C, 0000,013C,0180,0800,0000,117C
U 117C, 0000,003D,0180,0800,0000,1201
U 117D, 080C,0038,0180,0800,0000,135D
U 135D, 0001,003C,0180,09E8,0000,135E
U 135E, 001D,2000,0180,0800,0010,135F
U 135F, 0000,013C,0180,0800,0000,1180
U 1180, 0000,003D,0180,0800,0000,1201
U 1181, 0000,003C,0180,0800,0000,1182

```

```

.PAGE "TEST 78 WRITE RAB WITH DT/BYTE TEST"
*****
++
TEST 78 WRITE RAB WITH DT/BYTE TEST

TEST DESCRIPTION
THIS IS A TEST OF THE DATA TYPE DEPENDENCY OF
THE WRITE RA AND RB SCRATCH PAD FUNCTIONS.
DT=BYTE IS TESTED HERE.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED DATA IN R[0]
GOT DATA IN R[0]
--
*****
=0
RABDTB: NEWTST
RC[0F] K[.2]
ALU_Q-K[.1],R[0] ALU ; R[0]=FFFFFFFF
ALU_Q(K),R[0] ALU,DT/BYTE ; R[0]=FFFFFFF0, TEST INSTRUCTION
ALU_NOT.K[.FF],Q_ALU,RC[0E]_ALU ; GET EXPECTED DATA
D R[0]
RC[0D] D
ALU_Q-D,CLK.UBCC ; IS RA RESULT CORRECT?
Z?
=0
ERROR1
ALU_LB,D_ALU
RC[0D] D
ALU_Q-D,CLK.UBCC ; IS RB RESULT CORRECT?
Z?
=0
ERROR1
NOP
=0
ERLOOP
Q_K[.FF],RC[0E]_K[.FF] ; GET EXPECTED RESULT
R[0] 0 ; R[0]=00000000
ALU_Q-K[.1],D_ALU
ALU_D,R[0]_ALU,DT/BYTE ; R[0]=000000FF
D R[0]
RC[0D] D
ALU_Q-D,CLK.UBCC ; CHECK RA[0]
Z?
=0
ERROR1
ALU_LB,D_ALU
RC[0D] D
ALU_Q-D,CLK.UBCC ; CHECK RB[0]
Z?
=0
ERROR1
NOP

```

```

:3034 .PAGE "TEST 79 WRITE RAB WITH DT/WORD TEST"
:3035 *****
:3036 ++
:3037 TEST 79 WRITE RAB WITH DT/WORD TEST
:3038
:3039 TEST DESCRIPTION
:3040 THIS IS A TEST OF THE DATA TYPE DEPENDENCY OF
:3041 THE WRITE RA AND RB SCRATCH PAD FUNCTIONS.
:3042 DT=WORD IS TESTED HERE.
:3043
:3044 LOGIC DESCRIPTION
:3045
:3046 ERROR DESCRIPTION
:3047 EXPECTED RESULT (IN R[0])
:3048 ACTUAL RESULT (IN R[0])
:3049
:3050 --
:3051 *****
:3052 =0
:3053 RABDTW: NEWTST
:3054 RC[0F] K[.2]
:3055 ALU_0-K[.1],R[0] ALU ; R[0]=FFFFFFFF
:3056 ALU_0(K),R[0] ALU,DT/WORD ; R[0]=FFFF0000
:3057 ALU_NOT.K[.FFFF],Q_ALU,RC[0E]_ALU
:3058 D R[0]
:3059 RC[0D] D
:3060 ALU_Q-D,CLK.UBCC ; CHECK RA[0]
:3061 Z?
:3062 =0 ERROR1
:3063 ALU_LB,D_ALU
:3064 RC[0D] D
:3065 ALU_Q-D,CLK.UBCC ; CHECK RB[0]
:3066 Z?
:3067 =0 ERROR1
:3068 NOP
:3069 =0 ERLOOP
:3070 Q K[.FFFF],RC[0E]_K[.FFFF] ; GET EXPECTED RESULT
:3071 R[0] 0
:3072 ALU_0-K[.1],D ALU
:3073 ALU_D,R[0]_ALU,DT/WORD ; R[0]=0000FFFF
:3074 D R[0]
:3075 RC[0D] D
:3076 ALU_Q-D,CLK.UBCC ; CHECK RA[0]
:3077 Z?
:3078 =0 ERROR1
:3079 ALU_LB,D_ALU
:3080 RC[0D] D
:3081 ALU_Q-D,CLK.UBCC ; CHECK RB[0]
:3082 Z?
:3083 =0 ERROR1
:3084 NOP

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U 1182, 0000,003D,0180,0800,0000,11E9
U 1183, 0018,0038,0980,09F8,0000,1360
U 1360, 001B,0000,0580,0A80,0000,1361
U 1361, 0018,4038,1980,0A80,0000,1362
U 1362, 001B,001C,C1C0,09F0,0000,1363
U 1363, 0800,003C,0180,0A00,0000,1364
U 1364, 0001,003C,0180,09E8,0000,1365
U 1365, 001D,2000,0180,0800,0010,1366
U 1366, 0000,013C,0180,0800,0000,1184
U 1184, 0000,003D,0180,0800,0000,1201
U 1185, 080C,0038,0180,0800,0000,1367
U 1367, 0001,003C,0180,09E8,0000,1368
U 1368, 001D,2000,0180,0800,0010,1369
U 1369, 0000,013C,0180,0800,0000,1186
U 1186, 0000,003D,0180,0800,0000,1201
U 1187, 0000,003C,0180,0800,0000,1188
U 1188, 0000,003D,0180,0800,0000,1200
U 1189, 0018,0038,C1C0,09F0,0000,136A
U 136A, 0003,003C,0180,0A80,0000,136B
U 136B, 081B,0000,0580,0800,0000,136C
U 136C, 0001,403C,0180,0A80,0000,136D
U 136D, 0800,003C,0180,0A00,0000,136E
U 136E, 0001,003C,0180,09E8,0000,136F
U 136F, 001D,2000,0180,0800,0010,1370
U 1370, 0000,013C,0180,0800,0000,118A
U 118A, 0000,003D,0180,0800,0000,1201
U 118B, 080C,0038,0180,0800,0000,1371
U 1371, 0001,003C,0180,09E8,0000,1372
U 1372, 001D,2000,0180,0800,0010,1373
U 1373, 0000,013C,0180,0800,0000,118C
U 118C, 0000,003D,0180,0800,0000,1201
U 118D, 0000,003C,0180,0800,0000,1190

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:3085 .PAGE "TEST 7A SC AS ADDRESS SOURCE FOR RC REGISTERS TEST"
:3086 *****
:3087 ++
:3088 TEST 7A SC AS ADDRESS SOURCE FOR RC REGISTERS TEST
:3089
:3090 TEST DESCRIPTION
:3091 THIS IS A DUAL ADDRESSING TEST OF THE RC SCRATCH PADS
:3092 USING THE SC AS THE ADDRESS SOURCE.
:3093
:3094 LOGIC DESCRIPTION
:3095
:3096 ERROR DESCRIPTION
:3097 EXPECTED DATA
:3098 ACTUAL DATA
:3099 REGISTER ADDRESS
:3100
:3101 --
:3102 *****
:3103 =0
:3104 DARC: NEWTST
:3105 RC[3],K[F]
:3106 =0 ERLOOP
:3107 DARC1: SC RC[3],D RC[3] ; WRITE ADDRESS OF REGISTER IN REG
:3108 ALU D,RC(SC) ALU
:3109 =0 D3-0?,CALL,J7LTCHRC ; GO READ THE REGISTER BACK
:3110 ALU_D[A-B]LC,CLK.UBCC ; IS IT CORRECT?
:3111 Z?
:3112 =0 J/DARC15
:3113 J/DARC16
:3114 DARC15: RC[OF],K[.3]
:3115 RC[OE],D
:3116 RC[OD],LC
:3117 RC[OC],D,ERROR1 ; REPORT ERROR
:3118 DARC16: ALU_RC[3],CLK.UBCC
:3119 Z?
:3120 =0 RC[3],LA-K[.1],J/DARC1
:3121 RC[3],K[F]
:3122 =0 ERLOOP
:3123 DARC2: SC RC[3],D RC[3] ; READ THE ADDRESS OF EACH
:3124 LC RC(SC) ; REGISTER OUT OF EACH REGISTER.
:3125 ALU_D[A-B]LC,CLK.UBCC ; IS IT CORRECT?
:3126 Z?
:3127 =0 J/DARC25
:3128 J/DARC26
:3129 DARC25: RC[OF],K[.3]
:3130 RC[OE],D
:3131 RC[OD],LC
:3132 RC[OC],D,ERROR1 ; REPORT ERROR
:3133 DARC26: ALU_NOT,D,RC(SC) ALU ; WRITE THE COMPLEMENT OF EACH ADDRESS
:3134 ALU_RC[3],CLK.UBCC ; IN EACH REGISTER
:3135 Z?
:3136 =0 RC[3],LA-K[.1],J/DARC2
:3137 RC[3],K[F]
:3138 =0 ERLOOP
:3139 DARC3: SC RC[3],D RC[3] ; READ THE COMPLEMENT OF

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U 1190, 0000,003D,0180,0800,0000,11E9
U 1191, 0018,0038,6180,0A98,0000,1192
U 1192, 0000,003D,0180,0800,0000,1200
U 1193, 0800,003C,0180,0A18,0082,1374
U 1374, 0001,003C,0180,0838,0000,1194
U 1194, 0000,193D,0180,0800,0000,1080
U 1195, 0011,0000,0180,0800,0010,1375
U 1375, 0000,013C,0180,0800,0000,1196
U 1196, 0000,003C,0180,0800,0000,1376
U 1197, 0000,003C,0180,0800,0000,137A
U 1376, 0018,0038,0D80,09F8,0000,1377
U 1377, 0001,003C,0180,09F0,0000,1378
U 1378, 0010,0038,0180,09E8,0000,1379
U 1379, 0001,003D,0180,09E0,0000,1201
U 137A, 0000,003C,0180,0A18,0010,137B
U 137B, 0000,013C,0180,0800,0000,1198
U 1198, 0018,0000,0580,0A98,0000,1193
U 1199, 0018,0038,6180,0A98,0000,119A
U 119A, 0000,003D,0180,0800,0000,1200
U 119B, 0800,003C,0180,0A18,0082,137C
U 137C, 0000,003C,0180,0830,0000,137D
U 137D, 0011,0000,0180,0800,0010,137E
U 137E, 0000,013C,0180,0800,0000,119C
U 119C, 0000,003C,0180,0800,0000,137F
U 119D, 0000,003C,0180,0800,0000,1383
U 137F, 0018,0038,0D80,09F8,0000,1380
U 1380, 0001,003C,0180,09F0,0000,1381
U 1381, 0010,0038,0180,09E8,0000,1382
U 1382, 0001,003D,0180,09E0,0000,1201
U 1383, 0001,0028,0180,0838,0000,1384
U 1384, 0000,003C,0180,0A18,0010,1385
U 1385, 0000,013C,0180,0800,0000,11A0
U 11A0, 0018,0000,0580,0A98,0000,119B
U 11A1, 0018,0038,6180,0A98,0000,11A2
U 11A2, 0000,003D,0180,0800,0000,1200
U 11A3, 0800,003C,0180,0A18,0082,1386

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U	Address	OpCode	OpName	Comments
U 1386.	0000,003C,0180,0830,0000,1387	:3140	LC_RC(SC)	: EACH REGISTER'S ADDRESS
		:3141		: OUT OF EACH REGISTER.
U 1387.	0011,0010,0180,0800,0010,1388	:3142	ALU_D[A+B+1]LC,CLK.UBCC	: IS IT CORRECT?
U 1388.	0000,013C,0180,0800,0000,11A4	:3143	Z?	
U 11A4.	0000,003C,0180,0800,0000,1389	:3144	=0	
U 11A5.	0000,003C,0180,0800,0000,138D	:3145	J/DARC35	
U 1389.	0018,0038,0D80,09F8,0000,138A	:3146	DARC35: RC[0F] K[.3]	
U 138A.	0001,0028,0180,09F0,0000,138B	:3147	ALU_NOT.D,RC[0E]_ALU	
U 138B.	0010,0038,0180,09E8,0000,138C	:3148	RC[0D]_LC	
U 138C.	0001,003D,0180,09E0,0000,1201	:3149	RC[0C]_D,ERROR1	
U 138D.	0000,003C,0180,0A18,0010,138E	:3150	DARC36: ALU_R[3],CLK.UBCC	
U 138E.	0000,013C,0180,0800,0000,11A6	:3151	Z?	
U 11A6.	0018,0000,0580,0A98,0000,11A3	:3152	=0	
U 11A7.	0000,003C,0180,0800,0000,11A8	:3153	R[3]_LA-K[.1],J/DARC3	
			NOP	

```

:3154 .PAGE "TEST 7B RA AND RB ADDRESSED BY SC TEST"
:3155 *****
:3156 ++
:3157 TEST 7B RA AND RB ADDRESSED BY SC TEST
:3158
:3159 TEST DESCRIPTION
:3160 THIS IS A DUAL ADDRESSING TEST OF THE RA AND RB SCRATCH PADS
:3161 USING THE SC AS THE ADDRESS SOURCE.
:3162
:3163 LOGIC DESCRIPTION
:3164
:3165 ERROR DESCRIPTION
:3166 EXPECTED DATA
:3167 ACTUAL DATA
:3168 REGISTER ADDRESS
:3169
:3170 --
:3171 *****
:3172 =0
:3173 DARAB: NEWTST
:3174 RC[0F] K[.3]
:3175 RC[3] K[.F]
:3176 =0 ERLOOP
:3177 DARAB1: SC RC[3],D_RC[3] ; WRITE THE ADDRESS OF THE
:3178 RC[0E] D
:3179 RC[0C] D
:3180 ALU D,R(SC) ALU ; REGISTER IN THE REGISTER
:3181 =0 D3-D?,CALL,J/LTCHAB ; READ THE REGISTER
:3182 ALU_L[A-B]D,CLK.UBCC ; IS RA(SC) CORRECT?
:3183 Z?
:3184 =0 ERROR1,RC[0D] LA
:3185 ALU_D[A-B]LB,CLK.UBCC ; IS LB CORRECT?
:3186 Z?
:3187 =0 ERROR1,RC[0D] LB
:3188 Q RC[3],CLK.UBCC
:3189 Z?
:3190 =0 ALU Q-K[.1],RC[3]_ALU,J/DARAB1
:3191 RC[3] K[.F]
:3192 =0 ERLOOP
:3193 DARAB2: SC RC[3],D_RC[3] ; GO BACK AND READ EACH
:3194 RC[0C] D
:3195 ALU_NOT.D,RC[0E]_ALU
:3196 LAB_R(SC) ; REGISTER. CHECK THE DATA
:3197 ; AND WRITE IT BACK COMPLEMENTED.
:3198 ALU_L[A-B]D,CLK.UBCC ; IS LA CORRECT?
:3199 Z?
:3200 =0 ERROR1,RC[0D] LA
:3201 ALU_D[A-B]LB,CLK.UBCC ; IS LB CORRECT?
:3202 Z?
:3203 =0 ERROR1,RC[0D] LB
:3204 ALU_NOT.D,R(SC) ALU ; WRITE COMPLEMENTED DATA.
:3205 Q RC[3],CLK.UBCC
:3206 Z?
:3207 =0 ALU Q-K[.1],RC[3]_ALU,J/DARAB2
:3208 RC[3] K[.F]

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U 11A8, 0000,003D,0180,0800,0000,11E9
U 11A9, 0018,0038,0D80,09F8,0000,138F
U 138F, 0018,0038,6180,0998,0000,11AA
U 11AA, 0000,003D,0180,0800,0000,1200
U 11AB, 0810,0038,0180,0918,0082,1390
U 1390, 0001,003C,0180,09F0,0000,1391
U 1391, 0001,003C,0180,09E0,0000,1392
U 1392, 0001,003C,0180,08E8,0000,11AC
U 11AC, 0000,193D,0180,0800,0000,1070
U 11AD, 001C,2000,0180,0800,0010,1393
U 1393, 0000,013C,0180,0800,0000,11B0
U 11B0, 0000,003D,0180,09E8,0000,1201
U 11B1, 000D,0000,0180,0800,0010,1394
U 1394, 0000,013C,0180,0800,0000,11B2
U 11B2, 000C,0039,0180,09E8,0000,1201
U 11B3, 0010,0038,01C0,0918,0010,1395
U 1395, 0000,013C,0180,0800,0000,11B4
U 11B4, 0019,2000,0580,0998,0000,11AB
U 11B5, 0018,0038,6180,0998,0000,11B6
U 11B6, 0000,003D,0180,0800,0000,1200
U 11B7, 0810,0038,0180,0918,0082,1396
U 1396, 0001,003C,0180,09E0,0000,1397
U 1397, 0001,0028,0180,09F0,0000,1398
U 1398, 0000,003C,0180,0868,0000,1399
U 1399, 001C,2000,0180,0800,0010,139A
U 139A, 0000,013C,0180,0800,0000,11B8
U 11B8, 0000,003D,0180,09E8,0000,1201
U 11B9, 000D,0000,0180,0800,0010,139B
U 139B, 0000,013C,0180,0800,0000,11BA
U 11BA, 000C,0039,0180,09E8,0000,1201
U 11BB, 0001,0028,0180,08E8,0000,139C
U 139C, 0010,0038,01C0,0918,0010,139D
U 139D, 0000,013C,0180,0800,0000,11BC
U 11BC, 0019,2000,0580,0998,0000,11B7
U 11BD, 0018,0038,6180,0998,0000,11C0

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U 11C0.	0000,003D,0180,0800,0000,1200	:3209	=0	ERLOOP
U 11C1.	0810,0038,0180,0918,0082,139E	:3210	DARAB3:	SC_RC[3],D_RC[3] ; READ COMPLEMENTED DATA.
U 139E.	0001,003C,0180,09E0,0000,139F	:3211		RC[0C] D
U 139F.	0001,0028,0180,09F0,0000,13A0	:3212		ALU_NOT.D,RC[0E]_ALU
U 13A0.	0000,003C,0180,0868,0000,13A1	:3213		LAB_R(SC)
U 13A1.	001C,2010,0180,0800,0010,13A2	:3214		ALU_LA[A+B+1]D,CLK.UBCC ; IS LA CORRECT?
U 13A2.	0000,013C,0180,0800,0000,11C2	:3215		Z?
U 11C2.	0000,003D,0180,09E8,0000,1201	:3216	=0	ERROR1,RC[0D] LA
U 11C3.	000D,0010,0180,0800,0010,13A3	:3217		ALU_DLA+B+1]LB,CLK.UBCC ; IS LB CORRECT?
U 13A3.	0000,013C,0180,0800,0000,11C4	:3218		Z?
U 11C4.	000C,0039,0180,09E8,0000,1201	:3219	=0	ERROR1,RC[0D] LB
U 11C5.	0010,0038,01C0,0918,0010,13A4	:3220		Q_RC[3],CLK.UBCC
U 13A4.	0000,013C,0180,0800,0000,11C6	:3221		Z?
U 11C6.	0019,2000,0580,0998,0000,11C1	:3222	=0	ALU_Q-K[.1],RC[3]_ALU,J/DARAB3
U 11C7.	0000,003C,0180,0800,0000,11C8	:3223		NOP

[illegible]


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.PAGE    "TEST 7C          LA_RA[0-7] TEST"
*****
++
TEST 7C          LA_RA[0-7] TEST

TEST DESCRIPTION
THIS IS A TEST OF THE LA_RA[] FUNCTION OF THE USPO
FIELD.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED DATA
ACTUAL DATA
REGISTER ADDRESS

--
*****
=0
SP1:    NEWTST
        RC[0F]_K[.3]
        D_K[.F]
SP1A:   SC D ; WRITE A FLOATING 1 PATTERN
        ALU_NOT.MASK,R(SC)_ALU ; INTO THE RA AND RB REGISTERS
        ALU_D,CLK.UBCC
        Z?
=0      D_D-K[.1],J/SP1A
        Q_K[.7]
=0      ERLOOP
SP1B:   ALU_0-K[.1],RC[0F]_ALU ; PUT FFFFFFFF INTO LB
        LAB_RC[0F]
        D_Q,SC Q,RC[0C] Q
=0      D3-0?,CALL,J/SPTAB3 ; GO LATCH LA.
        ALU_LB,D_ALU,RC[0D]_LB ; SEE IF LB WAS AFFECTED.
        ALU_D+K[.1],CLK.UBCC
        Z?
=0      ERROR1,RC[0E]_ALU,ALU_0-K[.1] ; LB CLOCKED BY LA_RA[0-7]
        SC Q
        ALU_MASK,RC[0E]_ALU
        D_LA,RC[0D] LA
        ALU_D[A+B+1]MASK,CLK.UBCC ; IS LA CORRECT?
        Z?
=0      ERROR1
        ALU_Q,CLK.UBCC
        Z?
=0      Q_Q-K[.1],J/SP1B
        D_K[.F]
        SC D
        ALU_NOT.MASK,R(SC)_ALU
SP1C:   SC D,RC[0C] D ; MAKE SURE RA AND RB
        ALU_NOT.MASK,Q_ALU,RC[0E]_ALU ; WERE NOT WRITTEN BY LA_RA[0-7]
        ALU_R(SC)
        ALU_LA[A-B]Q,CLK.UBCC ; LA CORRECT?
        Z?
=0      ERROR1,RC[0D] LA

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16-DEC-82 10:59:52

U 11D9.	000D,2000,0180,0800,0010,13BA	:3279
U 13BA.	0000,013C,0180,0800,0000,11DA	:3280
U 11DA.	000C,0039,0180,09E8,0000,1201	:3281
U 11DB.	0001,003C,0180,0800,0010,13BB	:3282
U 13BB.	0000,013C,0180,0800,0000,11DC	:3283
U 11DC.	0819,0000,0580,0800,0000,13B5	:3284
U 11DD.	0000,003C,0180,0800,0000,13BC	:3285
		:3286
		:3287
U 1298.	0000,003E,0180,0880,0000,0001	:3288
U 1299.	0000,003E,0180,0888,0000,0001	:3289
U 129A.	0000,003E,0180,0890,0000,0001	:3290
U 129B.	0000,003E,0180,0898,0000,0001	:3291
U 129C.	0000,003E,0180,08A0,0000,0001	:3292
U 129D.	0000,003E,0180,08A8,0000,0001	:3293
U 129E.	0000,003E,0180,08B0,0000,0001	:3294
U 129F.	0000,003E,0180,08B8,0000,0001	:3295
U 13BC.	0000,003C,0180,0800,0000,11E0	:3296
		:3297
U 11E0.	0000,003D,0180,0800,0000,11E9	:3298

```

ALU_Q[A-B]LB,CLK.UBCC      ; LB CORRECT?
Z?
=0      ERROR1,RC[OD],LB
ALU_D,CLK.UBCC
Z?
=0      D,D-K[.1],J/SP1C
J7SP1D
; THIS TABLE IS USED TO EXECUTE THE LA_RA[0-7] FUNCTION:
=1000
SPTAB3: LA_RA[0],RETURN1
        LA_RA[1],RETURN1
        LA_RA[2],RETURN1
        LA_RA[3],RETURN1
        LA_RA[4],RETURN1
        LA_RA[5],RETURN1
        LA_RA[6],RETURN1
        LA_RA[7],RETURN1

SP1D:   NOP
=0
DUMMY1: NEWTST

```

[illegible]

ESKAH24.MCR

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SEQ 0278
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ES

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - 0FFF	Unused							
U 1000	1871:	1838	1845=	1861=	1862=	1863=	1972=	1973=
U 1008	1975=	1976=	2018=	2019=	2022=	2023=	2690=	2691=
U 1010	1953=	1954=	1955=	1956=	1957=	1958=	1959=	1960=
U 1018	1961=	1962=	1963=	1964=	1965=	1966=	1967=	1968=
U 1020	2001=	2002=	2003=	2004=	2005=	2006=	2007=	2008=
U 1028	2009=	2010=	2011=	2012=	2013=	2014=	2015=	2016=
U 1030	2046=	2047=	2048=	2049=	2050=	2051=	2052=	2053=
U 1038	2054=	2055=	2056=	2057=	2058=	2059=	2060=	2061=
U 1040	2034=	2035=	2120=	2121=	2123=	2124=	1839	2910=
U 1048	2126=	2127=	2131=	2132=	2134=	2135=	1902:	2911=
U 1050	2137=	2138=	2165=	2166=	2169=	2170=	1840	2925=
U 1058	2172=	2173=	1905:	1841	2181=	2182=	1908:	2926=
U 1060	2064=	2065=	2066=	2067=	2068=	2069=	2070=	2071=
U 1068	2072=	2073=	2074=	2075=	2076=	2077=	2078=	2079=
U 1070	2083=	2084=	2085=	2086=	2087=	2088=	2089=	2090=
U 1078	2091=	2092=	2093=	2094=	2095=	2096=	2097=	2098=
U 1080	2101=	2102=	2103=	2104=	2105=	2106=	2107=	2108=
U 1088	2109=	2110=	2111=	2112=	2113=	2114=	2115=	2116=
U 1090	2184=	2185=	2187=	2188=	2215=	2216=	2217=	2218=
U 1098	2220=	2221=	2229=	2230=	2232=	2233=	2694=	2695=
U 10A0	2235=	2236=	2257=	2258=	2262=	2263=	2264=	2265=
U 10A8	2266=	2267=	2276=	2277=	2278=	2279=	2698=	2699=
U 10B0	2287=	2288=	2309=	2310=	2315=	2316=	2334=	2335=
U 10B8	2337=	2338=	2340=	2341=	2344=	2345=	2703=	2704=
U 10C0	2384=	2385=	2389=	2390=	2405=	2406=	2408=	2409=
U 10C8	2411=	2412=	2415=	2416=	2436=	2437=	2707=	2708=
U 10D0	2438=	2439=	2440=	2441=	2457=	2458=	2459=	2460=
U 10D8	2468=	2469=	2475=	2476=	2477=	2478=	2710=	2711=
U 10E0	2486=	2487=	2493=	2494=	2495=	2496=	2503=	2504=
U 10E8	2510=	2511=	2512=	2513=	2520=	2521=	2713=	2714=
U 10F0	2527=	2528=	2529=	2530=	2537=	2538=	2544=	2545=
U 10F8	2546=	2547=	2554=	2555=	2561=	2562=	2716=	2717=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1842	2563=	2564=	1834:	1835:	1836:	1837:
U 1110	2570=	2571=	2577=	2578=	2579=	2580=	2586=	2587=
U 1118	2593=	2594=	2595=	2596=	2603=	2604=	2731=	2732=
U 1120	2610=	2611=	2612=	2613=	2620=	2621=	2627=	2628=
U 1128	2629=	2630=	2636=	2637=	2643=	2644=	2735=	2736=
U 1130	2645=	2646=	2652=	2653=	2676=	2677=	2685=	2686=
U 1138	2687=	2688=	2725=	2726=	2727=	2728=	2739=	2740=
U 1140	2778=	2779=	2780=	2781=	2814=	2815=	2816=	2817=
U 1148	2855=	2856=	2858=	2859=	2866=	2868=	2743=	2744=
U 1150	2874=	2875=	2877=	2879=	1843	1928:	2897=	2898=
U 1158	2904=	2905=	2906=	2907=	2918=	2919=	2749=	2750=
U 1160	2920=	2921=	2932=	2933=	2934=	2935=	2946=	2947=
U 1168	2948=	2949=	2960=	2961=	2962=	2963=	2754=	2755=
U 1170	2974=	2975=	2976=	2977=	3002=	3003=	3011=	3012=
U 1178	3016=	3017=	3018=	3019=	3027=	3028=	2757=	2758=
U 1180	3032=	3033=	3053=	3054=	3062=	3063=	3067=	3068=
U 1188	3069=	3070=	3078=	3079=	3083=	3084=	2760=	2761=
U 1190	3104=	3105=	3106=	3107=	3109=	3110=	3112=	3113=
U 1198	3120=	3121=	3122=	3123=	3127=	3128=	2764=	2765=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3136=	3137=	3138=	3139=	3144=	3145=	3152=	3153=
U 11A8	3173=	3174=	3176=	3177=	3181=	3182=	2769=	2770=
U 11B0	3184=	3185=	3187=	3188=	3190=	3191=	3192=	3193=
U 11B8	3200=	3201=	3203=	3204=	3207=	3208=	2783=	2784=
U 11C0	3209=	3210=	3216=	3217=	3219=	3220=	3222=	3223=
U 11C8	3243=	3244=	3250=	3251=	3252=	3253=	2787=	2788=
U 11D0	3256=	3257=	3260=	3261=	3266=	3267=	3269=	3270=
U 11D8	3278=	3279=	3281=	3282=	3284=	3285=	2791=	2792=
U 11E0	3298=	1844	1864	1865	1866	1867	1868	1869
U 11E8	1870	1880	1881	1882	1883	1884	2796=	2797=
U 11F0	1885	1886	1887	1888	1889	1890	1891	1892
U 11F8	1893	1894	1895	1896	1897	1898	2800=	2801=
U 1200	1899	1900	1901	1903	1904	1936	1937	1943
U 1208	1944	1945	1948	1949	1950	1951	2805=	2806=
U 1210	1969	1970	1974	1977	1978	1979	1980	1981
U 1218	1982	1983	1984	1985	1986	1987	2820=	2821=
U 1220	1988	1989	1990	1991	1992	1993	1994	1995
U 1228	1996	2017	2024	2025	2026	2027	2824=	2825=
U 1230	2028	2029	2030	2031	2036	2037	2038	2039
U 1238	2040	2041	2042	2043	2125	2136	2827=	2828=
U 1240	2167	2168	2171	2174	2175	2176	2177	2178
U 1248	2179	2180	2183	2189	2219	2222	2830=	2831=
U 1250	2223	2224	2225	2226	2227	2228	2231	2938=
U 1258	2237	2259	2260	2261	2268	2269	2270	2939=
U 1260	2272	2273	2274	2275	2280	2281	2283	2953=
U 1268	2284	2285	2286	2311	2312	2313	2314	2954=
U 1270	2317	2318	2319	2320	2321	2322	2323	2966=
U 1278	2324	2325	2326	2327	2328	2329	2330	2967=
U 1280	2331	2332	2333	2336	2339	2342	2343	2981=
U 1288	2346	2386	2387	2388	2391	2392	2393	2982=
U 1290	2394	2395	2396	2397	2398	2399	2400	2401
U 1298	3288=	3289=	3290=	3291=	3292=	3293=	3294=	3295=
U 12A0	2402	2403	2404	2407	2410	2413	2414	2417
U 12A8	2442	2443	1929:	2444	2445	2446	2447	2448
U 12B0	2449	2450	2451	2461	2462	2463	2464	2465
U 12B8	2466	2467	2479	2480	2481	2482	2483	2484
U 12C0	2485	2497	2498	2499	2500	2501	2502	2514
U 12C8	2515	2516	2517	2518	2519	2531	2532	2533
U 12D0	2534	2535	2536	2548	2549	2550	2551	2552
U 12D8	2553	2565	2566	2567	2568	2569	2581	2582
U 12E0	2583	2584	2585	2597	2598	2599	2600	2601
U 12E8	2602	2614	2615	2616	2617	2618	2619	2631
U 12F0	2632	2633	2634	2635	2647	2648	2649	2650
U 12F8	2651	2689	2692	2693	2696	2697	2700	2701
U 1300	2702	2705	2706	2709	2712	2715	2729	2730
U 1308	2733	2734	2737	2738	2741	2742	2745	2746
U 1310	2747	2748	2751	2752	2753	2756	2759	2762
U 1318	2763	2766	2767	2768	2782	2785	2786	2789
U 1320	2790	2793	2794	2795	2798	2799	2802	2803
U 1328	2804	2818	2819	2822	2823	2826	2829	2832
U 1330	2857	2860	2861	2862	2863	2864	2865	2869
U 1338	2870	2871	2872	2873	2876	2908	2909	2922
U 1340	2923	2924	2936	2937	2950	2951	2952	2964

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MICRO2

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2965	2978	2979	2980	3004	3005	3006	3007
U 1350	3008	3009	3010	3013	3014	3015	3020	3021
U 1358	3022	3023	3024	3025	3026	3029	3030	3031
U 1360	3055	3056	3057	3058	3059	3060	3061	3064
U 1368	3065	3066	3071	3072	3073	3074	3075	3076
U 1370	3077	3080	3081	3082	3108	3111	3114	3115
U 1378	3116	3117	3118	3119	3124	3125	3126	3129
U 1380	3130	3131	3132	3133	3134	3135	3140	3142
U 1388	3143	3146	3147	3148	3149	3150	3151	3175
U 1390	3178	3179	3180	3183	3186	3189	3194	3195
U 1398	3196	3198	3199	3202	3205	3206	3211	3212
U 13A0	3213	3214	3215	3218	3221	3245	3246	3247
U 13A8	3248	3249	3254	3255	3258	3259	3262	3263
U 13B0	3264	3265	3268	3271	3272	3273	3274	3275
U 13B8	3276	3277	3280	3283	3296			
U 13C0	- 13EF	Unused						
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

XXXXXXXXXXXXXXXXXXXX

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ESKAH24.MCR

MICRO2 1M(01)

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B 7

SEQ 0281
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ZZ-
ES

U
U
U
U
U

Words not
in bounds

ESKOODEF	0
ESKOO MAC	0
ESKAHMAC	0
ESKAH24	973

Used	973
Remaining	

Total microwords used in memory U: 973

Total microwords remaining in memory U: 0

Highest address used in memory U: 13FF (hex)

C 7

ZZ
ES

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH24.MIC

```
Pass 1 warnings:    0    Pass 2 warnings:    0
Pass 1 errors:      0    Pass 2 errors:      0
```

XXXXXXXXXXXX XXXX XXXX

```

3      Control ROM Field Definitions
548    Register Transfer Macro Definitions
1413   Non-transfer Functions
1485   Branch Enable Macro Definitions
1564   MICRO DIAGNOSTIC DEFINED MACROS
1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
2002   TEST 7D LAB R[1] AND WRITE RC FUNCTION TEST
2081   TEST 7E WRITE R[1] AND LATCH RC FUNCTION TEST
2160   TEST 7F LA AND LB CONTROL LOGIC TEST
2221   TEST 80 LC CONTROL LOGIC TEST
2284   TEST 81 WRITE RA AND RB CONTROL LOGIC TEST
2353   TEST 82 WRITE RC CONTROL LOGIC TEST
2426   TEST 83 VA, PC AND BMX/PC TEST
2467   TEST 84 VA INCREMENT FUNCTION TEST
2508   TEST 85 PC INCREMENT BY 1 TEST
2549   TEST 86 PC INCREMENT BY 2 TEST
2590   TEST 87 PC INCREMENT BY 4 TEST
2631   TEST 88 VIBA TEST
2671   TEST 89 PCSV REGISTER TEST
2717   TEST 8A BEN RLOG STACK EMPTY TEST
2782   TEST 8B RLOG STACK TEST
3029   TEST 8C BEN EALU.N TEST
3071   TEST 8D BEN EALU.Z TEST
3112   TEST 8E BEN ALU<01:00> TEST
3195   TEST 8F ILLEGAL FLOATING OPERAND UTRAP TEST

```

2222222

ZZ-ESKAH-V132 Subroutines
ESKAH25.MCR

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E 7

SEQ 0284
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:1 .NOLIST
:1804 .LIST
:1805

ZZ-ESKAH-V132 Subroutines
ESKAH25.MCR
MICRO2 1M(01) 16-DEC-82 11:01:45
E 7
SEQ 0284
Page
:1 .NOLIST
:1804 .LIST
:1805

```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      +
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814      :
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN0.
:1819      :
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823      :
:1824      :
:1825      1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
:1826      1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
:1827      1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
:1828      1103: SC_K[.3],J/TRPH0      : TB MODIFY
:1829      1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
:1830      1105: SC_K[.6],J/TRPH0      : TB MISS
:1831      1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
:1832      1107: SC_K[.7],J/TRPH0      : TB PARITY
:1833      1108: SC_K[.8],J/TRPH0      : CACHE PARITY
:1834      110C: SC_K[.C],J/TRPH1      : RDS
:1835      110D: SC_K[.D],J/TRPH1      : TIME OUT
:1836      110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
:1837      110F: SC_K[.F],J/TRPH1     : CS PARITY
:1838      TRPH0: Q_ID[USTACK]
:1839      : Q_D,D Q
:1840      : ID[USTACK]_D
:1841      : Q_D,D Q
:1842      : Q-R[OF]
:1843      : A[U_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
:1844      : Z?                                : BRANCH IF NO
:1845      : =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
:1846      :
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850      :
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      :

```

```

U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,1006
U 1006, 0C00,003C,01E0,0800,0000,100B
U 100B, 0000,003C,8180,3C00,0000,100E
U 100E, 0C00,003C,01E0,0800,0000,1043
U 1043, 0000,003C,01C0,0A78,0000,1046
U 1046, 0001,2024,0180,0800,0010,104B
U 104B, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

```

U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,71E3 :1862
U 1005, 0000,003C,49F0,2C00,0000,1053 :1863
U 1053, 0001,203C,4DF0,2DB0,0000,1056 :1864
U 1056, 0001,203C,65F0,2DB8,0000,1058 :1865
U 1058, 0001,203C,6DF0,2DD8,0000,1076 :1866
U 1076, 0001,203C,75F0,2DE0,0000,107E :1867
U 107E, 0001,203C,79F0,2DC8,0000,1089 :1868
U 1089, 0001,203C,69F0,2DC0,0000,108A :1869
U 108A, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1109 :1871

U 108E, 0000,003C,65F8,0800,0084,7095 :1880
U 1095, 0818,0038,8D80,0800,0000,1096 :1881
U 1096, 0D00,003C,0180,0800,0000,109E :1882
U 109E, 0000,003C,3D80,3C00,0000,10AA :1883
U 10AA, 0818,0038,0580,0800,0000,10AE :1884
U 10AE, 0D00,003C,0180,0800,0000,10B6 :1885
U 10B6, 0F00,003C,3180,3C00,0000,10BE :1886
U 10BE, 0000,003C,5D80,3C00,0000,10C6 :1887
U 10C6, 0000,003C,3980,3C00,0000,10CE :1888
U 10CE, 0000,003C,2980,3C00,0000,10D6 :1889
U 10D6, 0000,003C,4980,3C00,0000,10DE :1890
U 10DE, 0818,0038,C180,0800,0000,10E2 :1891
U 10E2, 0000,003C,6580,3C00,0000,10E6 :1892
U 10E6, 0F00,003C,6D80,3C00,0000,10EA :1893
U 10EA, 0000,003C,6D80,3C00,0000,10EE :1894
U 10EE, 0000,003C,6580,3C00,0000,10F2 :1895
U 10F2, 0003,003C,0180,09F0,0000,10F6 :1896
U 10F6, 0003,003C,0180,0AF8,0000,10FA :1897
U 10FA, 0003,003C,0180,09E8,0000,105E :1898
U 10FE, 0818,0038,0980,0800,0000,105E :1899
U 1109, 0810,0038,0180,0978,0000,1112 :1900
U 1112, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 1116, 0810,0038,0180,0978,0000,111A :1903
U 111A, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905

U 105E, 0000,003C,1D80,3C00,0000,105E :1906

U 13F0, 0000,003C,0180,0800,0000,13F1 :1907
U 13F1, 0000,003C,0180,0800,0000,13F2 :1908
U 13F2, 0000,003C,0180,0800,0000,13F3 :1909
U 13F3, 0000,003C,0180,0800,0000,13F4 :1910

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWST
ERLOOP
ERROR1
ERROR2

SCOPE: SC_KC.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_KC.1F] : ...
D_DAL.SC
ID[PSL]_D : WRITE THE PSL
D_KC.1] : SETUP TO CLEAR THE CES REGISTER
D_DAL.SC
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.TS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.TS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_KC.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D

RC[0E] 0
RC[0F] 0
RC[0D] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_KC.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]

D_D.AND.KC.FF00]
104E: D_D.OR.KC.4],J/CALLCON

ERROR2: D_RC[0F]
D_D.AND.KC.FF00]
105A: D_D.OR.KC.6],J/CALLCON

105E:
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,111E :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 111E, 0810,0038,4D80,0978,0000,1154 :1936
U 1154, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 11E3, 0010,0038,01C0,0978,0000,11E4 :1943
U 11E4, 0019,2034,4DC0,0800,0000,11E5 :1944
U 11E5, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
U 11E6, 0118,0038,1B80,0800,0000,11EA :1947
U 11E7, 0118,0038,0B80,0800,0000,11EA :1948
U 11E8, 0118,0038,0780,0800,0000,11EA :1949
U 11E9, 0118,0038,C380,0800,0000,11EA :1950
:1951
U 1010, 0018,0038,1980,0800,0000,11E6 :1952
U 1011, 0018,0038,1980,0800,0000,11E7 :1953
U 1012, 0018,0038,1980,0800,0000,11E8 :1954
U 1013, 0018,0038,1980,0800,0000,11E9 :1955
U 1014, 0018,0038,0980,0800,0000,11E6 :1956
U 1015, 0018,0038,0980,0800,0000,11E7 :1957
U 1016, 0018,0038,0980,0800,0000,11E8 :1958
U 1017, 0018,0038,0980,0800,0000,11E9 :1959
U 1018, 0018,0038,0580,0800,0000,11E6 :1960
U 1019, 0018,0038,0580,0800,0000,11E7 :1961
U 101A, 0018,0038,0580,0800,0000,11E8 :1962
U 101B, 0018,0038,0580,0800,0000,11E9 :1963
U 101C, 0018,0038,C180,0800,0000,11E6 :1964
U 101D, 0018,0038,C180,0800,0000,11E7 :1965
U 101E, 0018,0038,C180,0800,0000,11E8 :1966
U 101F, 0018,0038,C180,0800,0000,11E9 :1967
U 11EA, 0100,003E,0380,0800,0000,0001 :1968
U 11EB, 0018,0038,0580,0800,0000,11EC :1969
U 11EC, 0118,0038,0780,0800,0000,11ED :1970

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

+
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.

-
SUBTST: D RC[OF],KMX/.FF00
RC[OF],D+K[.FF00],WORD,RETURN1

+
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

-
SETRCF: Q RC[OF]
Q-Q.AND.K[.FF00]
RC[OF],Q.OR.SC,RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX

=0000
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D,D.LEFT2,SI/7,RETURN1
DCAAAA: A[U_K[.1]
ALU_K[.1],D,D.LEFT2,SI/7

[illegible]

```

:2002 .PAGE "TEST 7D LAB_RC[1] AND WRITE RC FUNCTION TEST"
:2003 *****
:2004 ++
:2005 TEST 7D LAB_RC[1] AND WRITE RC FUNCTION TEST
:2006
:2007 TEST DESCRIPTION
:2008 THIS IS A TEST OF THE SPO FIELD FUNCTION WHICH
:2009 LATCHES RAB[1] AND WRITES RC[1].
:2010
:2011 ERROR DESCRIPTION
:2012 EXPECTED RC REGISTER DATA
:2013 GOT RC REGISTER DATA
:2014 RC REGISTER ADDRESS BEING TESTED
:2015 EXPECTED LA/LB LATCH CONTENTS
:2016 GOT LA/LB LATCH CONTENTS
:2017 ERROR CODE:
:2018 0=> RC INCORRECT
:2019 1=> LA/LB INCORRECT
:2020
:2021 --
:2022 *****
:2023 =0
:2024 SP2: NEWTST
:2025 RC[0F],K[.6]
:2026 RC[0B],K[.2]
:2027 D,K[.8]
:2028 SP2A: SC D
:2029 ALU_NOT.MASK,R(SC)_ALU
:2030 ALU_D,CLK.UBCC
:2031 Z?
:2032 =0 D,D-K[.1],J/SP2A
:2033 D,K[.8]
:2034 SP2B: SC D
:2035 ALU_NOT.MASK,RC(SC)_ALU
:2036 ALU_D,CLK.UBCC
:2037 Z?
:2038 =0 D,D-K[.1],J/SP2B
:2039 Q,K[.8]
:2040 =0 ERLOOP
:2041 SP2C: SC Q,D,Q,RC[0C],Q
:2042 =0 LAB_RC[0F],D3-0?,CALL,J/SP2AB2
:2043 ALU_RC(SC),D,_ALU
:2044 RC[0D],D
:2045 RC[0E],ALU,ALU MASK
:2046 ALU_LA,RC[0A],ALU
:2047 ALU_D[A-B]MASK,CLK.UBCC
:2048 Z?,RC[9],0
:2049 =0 ERROR1
:2050 ALU_LA-K[.2],CLK.UBCC
:2051 Z?,RC[9],K[.1]
:2052 =0 ERROR1
:2053 ALU_LB,D,ALU,RC[0A],ALU
:2054 ALU_D-K[.2],CLK.UBCC
:2055 Z?
:2056 =0 ERROR1
    
```

: SET UP A COUNTER TO WRITE THE RA/RB REGISTERS
 : 1 IS WRITTEN INTO RA/RB REGISTER 0
 : 2 IS WRITTEN INTO RA/RB REGISTER 1
 : 4 IS WRITTEN INTO RA/RB REGISTER 2
 : ETC TO 100 IS WRITTEN INTO RA/RB REGISTER 8
 : SET UP A COUNTER TO WRITE THE RC REGISTER
 : 1 IS WRITTEN INTO RC REGISTER 0
 : 2 IS WRITTEN INTO RC REGISTER 1
 : 4 IS WRITTEN INTO RC REGISTER 3
 : 8 IS WRITTEN INTO RC REGISTER 4
 : ETC TO 100 IS WRITTEN INTO RC REGISTER 8
 : SET UP A COUNTER FOR THE ACTUAL TEST
 : GET READY TO COMPLIMENT THE DATA IN
 : LAB_RC[0F],D3-0?,CALL,J/SP2AB2 : RC[1] AND LATCH LA/LB
 : GET THE RESULT OF THE TEST FUNCTION
 : SAVE IT IN CASE OF ERROR
 : GET THE EXPECTED RESULT.
 : READ THE CONTENTS OF LA
 : SEE IF THE RC REGISTER WAS CORRECT
 : RC[1] INCORRECT AFTER TEST FUNCTION
 : SEE IF LA WAS CORRECT
 : LA INCORRECT AFTER TEST INSTRUCTION
 : SEE IF LB IS CORRECT
 : LB INCORRECT AFTER TEST INSTRUCTION

U 1044, 0000,003D,0180,0800,0000,108E
 U 1045, 0018,0038,D580,09F8,0000,11F5
 U 11F5, 0018,0038,0980,09D8,0000,11F6
 U 11F6, 0818,0038,0180,0800,0000,11F7
 U 11F7, 0001,003C,0180,0800,0082,11F8
 U 11F8, 0003,001C,0180,08E8,0000,11F9
 U 11F9, 0001,003C,0180,0800,0010,11FA
 U 11FA, 0000,013C,0180,0800,0000,104C
 U 104C, 0819,0000,0580,0800,0000,11F7
 U 104D, 0818,0038,0180,0800,0000,11FB
 U 11FB, 0001,003C,0180,0800,0082,11FC
 U 11FC, 0003,001C,0180,0838,0000,11FD
 U 11FD, 0001,003C,0180,0800,0010,11FE
 U 11FE, 0000,013C,0180,0800,0000,1054
 U 1054, 0819,0000,0580,0800,0000,11FB
 U 1055, 0018,0038,01C0,0800,0000,1058
 U 1058, 0000,003D,0180,0800,0000,10FE
 U 1059, 0C01,203C,0180,09E0,0082,105C
 U 105C, 0000,193D,0180,0A78,0000,1030
 U 105D, 0810,0038,0180,0830,0000,11FF
 U 11FF, 0001,003C,0180,09E8,0000,1200
 U 1200, 0000,0038,0180,09F0,0000,1201
 U 1201, 0000,003C,0180,09D0,0000,1202
 U 1202, 0001,0000,0180,0800,0010,1203
 U 1203, 0003,013C,0180,09C8,0000,1078
 U 1078, 0000,003D,0180,0800,0000,1109
 U 1079, 0018,0000,0980,0800,0010,1204
 U 1204, 0018,0138,0580,09C8,0000,107A
 U 107A, 0000,003D,0180,0800,0000,1109
 U 107B, 080C,0038,0180,09D0,0000,1205
 U 1205, 0019,0000,0980,0800,0010,1206
 U 1206, 0000,013C,0180,0800,0000,107C
 U 107C, 0000,003D,0180,0800,0000,1109


```

:2081 .PAGE 'TEST 7E WRITE RC[1] AND LATCH RC FUNCTION TEST'
:2082 *****
:2083 ++
:2084 TEST 7E WRITE RA AND RB AND LATCH RC FUNCTION TEST
:2085
:2086 TEST DESCRIPTION
:2087 THIS IS A TEST OF THE SPO FIELD FUNCTION WHICH
:2088 LATCHES RC[] AND WRITES RAB[1].
:2089
:2090 ERROR DESCRIPTION
:2091 EXPECTED CONTENTS OF RA/RB REGISTER 1
:2092 GOT CONTENTS OF RA/RB REGISTER 1
:2093 RC SCRATCH PAD ADDRESS USED
:2094 EXPECTED CONTENTS OF LC LATCH
:2095 GOT CONTENTS OF LC LATCH
:2096 ERROR CODE:
:2097 0=> LC INCORRECT
:2098 1=> RA/RB INCORRECT
:2099
:2100 --
:2101 *****
:2102
:2103 SP3: NEWTST
:2104 RC[0F]_K[.6]
:2105 RC[0E]_0
:2106 D_K[.8] : SET UP A COUNTER TO WRITE THE RA/RB REGISTERS
:2107 SP3A: SC D : 1 IS WRITTEN INTO RA/RB 0
:2108 ALD_MASK,R(SC)_ALU : 2 IS WRITTEN INTO RA/RB 1
:2109 ALU_D,CLK.UBCC : 4 IS WRITTEN INTO RA/RB 3
:2110 Z? : 8 IS WRITTEN INTO RA/RB 4
:2111 =0 D_D-K[.1],J/SP3A : ETC TO 100 IS WRITTEN INTO RA/RB 8
:2112 D_K[.8] : SET UP A COUNTER TO WRITE THE RC REGISTERS
:2113 SP3B: SC D : 1 IS WRITTEN INTO RC REGISTER 0
:2114 ALD_MASK,RC(SC)_ALU : 2 IS WRITTEN INTO RC REGISTER 1
:2115 ALU_D,CLK.UBCC : 4 IS WRITTEN INTO RC REGISTER 2
:2116 Z? : 8 IS WRITTEN INTO RC REGISTER 3
:2117 =0 D_D-K[.1],J/SP3B : ETC TO 100 IS WRITTEN INTO RC REGISTER 8
:2118 Q_K[.8] : SET UP A COUNTER FOR THE ACTUAL TEST
:2119 =0 ERLOOP
:2120 SP3C: SC Q,D,Q : GET READY TO LATCH RC[] AND WRITE RA/RB 1
:2121 ALD_0-RC[.1],RC[1]_ALU : INITIALIZE RC[1] TO -1
:2122 =0 LAB_RC[0F],D3-0?,CALL,J/SPTAB1 : GO TO THE TABLE FOR THE TEST INSTRUCTION
:2123 SC Q,RC[0C]_Q
:2124 ALD_MASK,RC[0B]_ALU : GET THE EXPECTED RESULT
:2125 D_LC,RC[0A]_ALU : GET THE ACTUAL RESULT FROM LC
:2126 ALU_D[A-B]_MASK,CLK.UBCC : IS IT CORRECT?
:2127 Z?,RC[9]_0
:2128 =0 ERROR1 : LC INCORRECT AFTER TEST FUNCTION
:2129 LAB_RC[1] : CHECK RA/RB 1
:2130 ALU_LB,RC[0D]_ALU,CLK.UBCC
:2131 Z?,RC[9]_K[.1]
:2132 =0 ERROR1 : RB 1 INCORRECT AFTER TEST INSTRUCTION
:2133 ALU_LA,RC[0D]_ALU,CLK.UBCC
:2134 Z?
:2135 =0 ERROR1 : RA 1 INCORRECT AFTER TEST INSTRUCTION

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U 10B5.	0001,203C,0180,0800,0010,121C	:2136	ALU_Q,CLK.UBCC	: SEE IF EACH REGISTER ADDRESS
U 121C.	0000,013C,0180,0800,0000,10B8	:2137	Z?	: 0 THRU 8 HAS BEEN TRIED.
U 10B8.	0019,2000,05C0,0800,0000,10A9	:2138	=0 Q-Q[K.1],J/SP3C	: IF NOT CONTINUE
U 10B9.	0000,003C,0180,0800,0000,121D	:2139	NOB	
U 121D.	0000,003C,0180,0800,0000,121E	:2140	J/SP3F	
		:2141	: THIS TABLE IS USED TO EXECUTE THE TEST INSTRUCTION:	
		:2142	=0000	
U 1060.	0018,003A,1980,0B80,0000,0001	:2143	SPTAB1: LC_RCE[0]&R1_ALU,ALU_0(K),RETURN1	
U 1061.	0018,003A,1980,0B88,0000,0001	:2144	LC_RCE[1]&R1_ALU,ALU_0(K),RETURN1	
U 1062.	0018,003A,1980,0B90,0000,0001	:2145	LC_RCE[2]&R1_ALU,ALU_0(K),RETURN1	
U 1063.	0018,003A,1980,0B98,0000,0001	:2146	LC_RCE[3]&R1_ALU,ALU_0(K),RETURN1	
U 1064.	0018,003A,1980,0BA0,0000,0001	:2147	LC_RCE[4]&R1_ALU,ALU_0(K),RETURN1	
U 1065.	0018,003A,1980,0BA8,0000,0001	:2148	LC_RCE[5]&R1_ALU,ALU_0(K),RETURN1	
U 1066.	0018,003A,1980,0BB0,0000,0001	:2149	LC_RCE[6]&R1_ALU,ALU_0(K),RETURN1	
U 1067.	0018,003A,1980,0BB8,0000,0001	:2150	LC_RCE[7]&R1_ALU,ALU_0(K),RETURN1	
U 1068.	0018,003A,1980,0BC0,0000,0001	:2151	LC_RCE[8]&R1_ALU,ALU_0(K),RETURN1	
U 1069.	0018,003A,1980,0BC8,0000,0001	:2152	LC_RCE[9]&R1_ALU,ALU_0(K),RETURN1	
U 106A.	0018,003A,1980,0BD0,0000,0001	:2153	LC_RCE[0A]&R1_ALU,ALU_0(K),RETURN1	
U 106B.	0018,003A,1980,0BD8,0000,0001	:2154	LC_RCE[0B]&R1_ALU,ALU_0(K),RETURN1	
U 106C.	0018,003A,1980,0BE0,0000,0001	:2155	LC_RCE[0C]&R1_ALU,ALU_0(K),RETURN1	
U 106D.	0018,003A,1980,0BE8,0000,0001	:2156	LC_RCE[0D]&R1_ALU,ALU_0(K),RETURN1	
U 106E.	0018,003A,1980,0BF0,0000,0001	:2157	LC_RCE[0E]&R1_ALU,ALU_0(K),RETURN1	
U 106F.	0018,003A,1980,0BF8,0000,0001	:2158	LC_RCE[0F]&R1_ALU,ALU_0(K),RETURN1	
U 121E.	0000,003C,0180,0800,0000,10BA	:2159	SP3F: NOB	

```

:2160 .PAGE "TEST 7F LA AND LB CONTROL LOGIC TEST"
:2161 *****
:2162 ++
:2163 TEST 7F LA AND LB CONTROL LOGIC TEST
:2164
:2165 TEST DESCRIPTION
:2166 THIS IS A TEST OF THE CONTROL LOGIC FOR THE LA AND LB
:2167 REGISTER LATCHES. THIS TEST INSURES THAT THESE LATCHES
:2168 ARE NOT CLOCKED AT TIMES WHEN THEY SHOULD NOT BE
:2169 CLOCKED.
:2170
:2171 ERROR DESCRIPTION
:2172 EXPECTED LA OR LB
:2173 GOT LA OR LB
:2174 FUNCTION TRIED (SHOULD NOT HAVE AFFECTED LA OR LB)
:2175 AS IDENTIFIED BY:
:2176 5 SPO/70
:2177 4 SPO/30
:2178 3 SPO/50
:2179 2 SPO/00
:2180 1 SPO/18
:2181 0 SPO/28
:2182
:2183 --
:2184 *****
:2185 =0
:2186 LABT: NEWTST
:2187 Q-K[.4]
:2188 Q-Q+K[.1] ; INITIALIZE A COUNTER USED FOR THIS TEST
:2189 =0 ERLOOP
:2190 LABT1: R[0] 0 ; INITIALIZE LA AND LB
:2191 LAB R[0] ; TO 0
:2192 SC R[.F] ; WRITE -1 INTO ALL RA/RB
:2193 LABT2: ALU 0-K[.1],R(SC)_ALU ; REGISTERS 0 THRU F
:2194 SC.RE.0?
:2195 =011 J/LABT3
:2196 SC SC-K[.1],J/LABT2
:2197 LABT3: D 0 ; GO EXECUTE THE FUNCTION CURRENTLY BEING
:2198 D3-0? CALL J/RTAB1 ; TESTED, LA/LB SHOULD NOT BE AFFECTED
:2199 RC[0F]_K[.3]
:2200 ALU LA-RC[0D]_ALU,CLK.UBCC ; SEE IF LA IS CORRECT
:2201 Z?,RC[0E] 0
:2202 =0 ERROR1,RC[0C]_Q ; LA MODIFIED WHEN IT SHOULD NOT HAVE BEEN
:2203 ALU_LB,RC[0D]_ALU,CLK.UBCC ; SEE IF LB IS CORRECT
:2204 Z?
:2205 =0 ERROR1,RC[0C]_Q ; LB MODIFIED WHEN IT SHOULD NOT HAVE BEEN
:2206 ALU_Q,CLK.UBCC ; TRIED ALL THE TEST FUNCTIONS?
:2207 Z?
:2208 =0 Q-Q-K[.1],J/LABT1 ; IF NOT CONTINUE
:2209 J7LABT4
:2210 ; THIS IS A TABLE OF THE FUNCTIONS TESTED. THESE FUNCTIONS
:2211 ; SHOULD NOT AFFECT THE CONTENTS OF THE LA AND LB LATCHES:
:2212 =0000
:2213 RTAB1: SPO/28,RETURN1 ; LOAD LC[18-TF]
:2214 SPO/18,RETURN1 ; WRITE RAB[ACN]

```

U 10BA, 0000,003D,0180,0800,0000,108E
U 10BB, 0018,0038,11C0,0800,0000,121F
U 121F, 0019,2014,05C0,0800,0000,10BC
U 10BC, 0000,003D,0180,0800,0000,10FE
U 10BD, 0003,003C,0180,0A80,0000,1220
U 1220, 0000,003C,0180,0A00,0000,1221
U 1221, 0000,003C,6180,0800,0084,7222
U 1222, 001B,0000,0580,08E8,0000,1223
U 1223, 0000,0C3C,0180,0800,0000,10E3
U 10E3, 0000,003C,0180,0800,0000,1224
U 10E7, 0000,003C,0580,0800,0084,B222
U 1224, 0C00,003C,0180,0800,0000,10C0
U 10C0, 0000,193D,0180,0800,0000,1070
U 10C1, 0018,0038,0D80,09F8,0000,1225
U 1225, 0000,003C,0180,09E8,0010,1226
U 1226, 0003,013C,0180,09F0,0000,10C2
U 10C2, 0001,203D,0180,09E0,0000,1109
U 10C3, 000C,0038,0180,09E8,0010,1227
U 1227, 0000,013C,0180,0800,0000,10C4
U 10C4, 0001,203D,0180,09E0,0000,1109
U 10C5, 0001,203C,0180,0800,0010,1228
U 1228, 0000,013C,0180,0800,0000,10C8
U 10C8, 0019,2000,05C0,0800,0000,10BD
U 10C9, 0000,003C,0180,0800,0000,1229

U 1070, 0000,003E,0180,0940,0000,0001
U 1071, 0000,003E,0180,08C0,0000,0001

```

: NOP
: WRITE RAB[R0-R7]
: WRITE RC[T0-T7]
: LOAD LC[T0-TF] AND WRITE RAB[R1]

```

U 1229, 0000,003C,0180,0800,0000,10CA ;2220 LABT4: NOP

:2221
:2222
:2223
:2224
:2225
:2226
:2227
:2228
:2229
:2230
:2231
:2232
:2233
:2234
:2235
:2236
:2237
:2238
:2239
:2240
:2241
:2242
:2243
:2244
:2245
:2246
:2247
:2248
:2249
:2250
:2251
:2252
:2253
:2254
:2255
:2256
:2257
:2258
:2259
:2260
:2261
:2262
:2263
:2264
:2265
:2266
:2267
:2268
:2269
:2270
:2271
:2272
:2273
:2274
:2275

U 10CA, 0000,003D,0180,0800,0000,108E
U 10CB, 0018,0038,01C0,0800,0000,10CC
U 10CC, 0000,003D,0180,0800,0000,10FE
U 10CD, 0003,003C,0180,0980,0000,122A
U 122A, 0000,003C,0180,0900,0000,122B
U 122B, 0000,003C,6180,0800,0084,722C
U 122C, 001B,0000,0580,0838,0000,122D
U 122D, 0000,0C3C,0180,0800,0000,10EB
U 10EB, 0000,003C,0180,0800,0000,122E
U 10EF, 0000,003C,0580,0800,0084,822C
U 122E, 0C00,003C,0180,0800,0000,10D0
U 10D0, 0000,193D,0180,0800,0000,1080
U 10D1, 0018,0038,0D80,09F8,0000,122F
U 122F, 0010,0038,0180,09E8,0010,1230
U 1230, 0003,013C,0180,09F0,0000,10D2
U 10D2, 0001,203D,0180,09E0,0000,1109

U 10D3, 0001,203C,0180,0800,0010,1231
U 1231, 0000,013C,0180,0800,0000,10D4
U 10D4, 0019,2000,05C0,0800,0000,10CD
U 10D5, 0000,003C,0180,0800,0000,1232

U 1080, 0000,003E,0180,0A30,0000,0001
U 1081, 0000,003E,0180,08B0,0000,0001
U 1082, 0000,003E,0180,0870,0000,0001

```

.PAGE  "TEST 80          LC CONTROL LOGIC TEST"
*****
++
TEST 80          LC CONTROL LOGIC TEST

TEST DESCRIPTION
THIS IS A TEST OF THE LC LATCH CONTROL LOGIC. THIS
TEST INSURES THAT THE LATCH IS NOT CLOCKED WHEN IT
SHOULD NOT BE CLOCKED.

ERROR DESCRIPTION
EXPECTED LC
GOT LC
FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED LC)
AS IDENTIFIED BY:
      8      SPO/50
      7      SPO/30
      6      SPO/60
      5      SPO/07
      4      SPO/04
      3      SPO/02
      2      SPO/0E
      1      SPO/16
      0      SPO/46
--
*****
=0
LCT:  NEWTST
      Q_K[.8]          ; INITIALIZE A COUNTER
=0
ERLOOP
LCT1:  RC[0] 0          ; PUT 0 IN THE LC LATCH
      LC_RC[0]
      SC_K[.F]          ; MAKE THE CONTENTS OF ALL
LCT2:  ALD 0-K[.1],RC(SC)_ALU ; THE RC REGISTER -1
      SC_NE.0?
=011
      J/LCT3
      SC_SC-K[.1],J/LCT2
LCT3:  D 0              ; GO EXECUTE THE FUNCTION
=0
      D3-0?,CALL J/RTAB2 ; WHICH SHOULD NOT AFFECT THE LC LATCH
      RC[0F]_K[.3]
      ALU_LC_RC[0D]_ALU,CLK.UBCC ; SEE IF THE LC LATCH WAS AFFECTED
      Z?,RC[0E] 0
=0
      ERROR1,RC[0C]_Q    ; LC WAS CHANGED BY A FUNCTION
                        ; WHICH SHOULD NOT HAVE HAD ANY AFFECT ON IT
      ALU_Q,CLK.UBCC     ; SEE IF ALL THE FUNCTIONS IN THE
      Z?                 ; TABLE HAVE BEEN TESTED
=0
      Q_Q-K[.1],J/LCT1   ; IF NOT CONTINUE
      J7LCT4
; THIS TABLE CONTAINS REGISTER FUNCTIONS WHICH INSURE THAT
; LC IS NOT LATCHED AT TIMES WHEN IT SHOULD NOT BE LATCHED:
=0000
RTAB2: SPO/46,RETURN1    ; LOAD LAB[R6]
      SPO/16,RETURN1    ; LOAD LA[R6]
      SPO/0E,RETURN1    ; LOAD LAB[ACN=6]

```


ZZ-ESKAH-V132 TEST 80 LC CONTROL LOGIC TEST
ESKAH25.MCR MICRO2 1M(01)

D 8

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SEQ 0296
Page 6

U 1083, 0000,003E,0180,0810,0000,0001 :2276
U 1084, 0000,003E,0180,0820,0000,0001 :2277
U 1085, 0000,003E,0180,0838,0000,0001 :2278
U 1086, 0000,003E,0180,0800,0000,0001 :2279
U 1087, 0000,003E,0180,0980,0000,0001 :2280
U 1088, 0000,003E,0180,0A80,0000,0001 :2281
 :2282
U 1232, 0000,003C,0180,0800,0000,10D8 :2283

=
LCT4: NOP
SPO/02,RETURN1
SPO/04,RETURN1
SPO/07,RETURN1
SPO/60,RETURN1
SPO/30,RETURN1
SPO/50,RETURN1

: NOP
: NOP
: WRITE RC[SC]
: LOAD LAB[R1] AND WRITE RC[TO-TF]
: WRITE RC[TO-TF]
: WRITE RAB[RO-RF]

ZZ
ES
0000 0000
0000 0000

```

:2284 .PAGE "TEST 81 WRITE RA AND RB CONTROL LOGIC TEST"
:2285 *****
:2286 ++
:2287 TEST 81 WRITE RA AND RB CONTROL LOGIC TEST
:2288
:2289 TEST DESCRIPTION
:2290 THIS IS A TEST OF THE WRITE RA AND RB CONTROL
:2291 LOGIC THIS TEST INSURES THAT THESE REGISTERS
:2292 ARE NOT WRITTEN WHEN THEY ARE NOT SUPPOSED
:2293 TO BE WRITTEN.
:2294
:2295 ERROR DESCRIPTION
:2296 EXPECTED DATA
:2297 ACTUAL DATA
:2298 REGISTER ADDRESS
:2299 FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED RA OR RB)
:2300 AS GIVEN BY:
:2301 4 SPO/60
:2302 3 SPO/10
:2303 2 SPO/08
:2304 1 SPO/38
:2305 0 SPO/40
:2306
:2307 --
:2308 *****
:2309 =0
:2310 RABT: NEWTST
:2311 Q K[.4] : INITILAIIZE A COUNTER
:2312 =0 ERLOOP
:2313 RABT2: SC K[.F] : SET ALL THE RA AND RB REGISTERS
:2314 RABT3: ALD Q(K),R(SC)_ALU : TO 0
:2315 SC.NE.0?
:2316 =011 J/RABT4
:2317 SC SC-K[.1],J/RABT3
:2318 RABT4: D 0 : GO EXECUTE A FUNCTION IN THE TABLE.
:2319 =0 D3-0?,CALL,J/RTAB3 : THIS FUNCTION SHOULD NOT WRITE ANY RA OR RB REGIST
:2320 SC K[.F] : SEE IF THE RA AND RB
:2321 RABT5: LAB R(SC) : REGISTERS ARE INTACT
:2322 ALU_LA,RC[OD]_ALU,CLK.UBCC ; IS RA OK
:2323 RC[OF]_K[.4]
:2324 RC[OE]_0
:2325 Z?,ALU_SC,RC[OC]_ALU
:2326 =0 ERROR1,RC[OB]_Q : RA REGISTER CONTENTS WAS CHANGED BY
:2327 : A FUNCTION WHICH SHOULD HAVE NOT CHANGE
:2328 : ANY RA REGISTER
:2329 ALU_LB,RC[OD]_ALU,CLK.UBCC ; CHECK THE RB REGISTERS
:2330 Z?
:2331 =0 ERROR1,RC[OB]_Q : AN RB REGISTER WAS CHANGED BY A
:2332 : FUNCTION WHICH SHOULD HAVE
:2333 : HAD NO AFFECT ON THE RB REGISTERS.
:2334 SC.NE.0? : SEE IF ALL REGISTERS HAVE BEEN CHECKED
:2335 =011 J/RABT6
:2336 SC SC-K[.1],J/RABT5 : IF NOT CONTINUE
:2337 RABT6: ALD Q,CLK.UBCC : SEE IF ALL THE TEST FUNCTIONS
:2338 Z? : HAVE BEEN TRIED
    
```

U 10D8, 0000,003D,0180,0800,0000,108E
 U 10D9, 0018,0038,11C0,0800,0000,10DA
 U 10DA, 0000,003D,0180,0800,0000,10FE
 U 10DB, 0000,003C,6180,0800,0084,7233
 U 1233, 0018,0038,1980,08E8,0000,1234
 U 1234, 0000,0C3C,0180,0800,0000,10F3
 U 10F3, 0000,003C,0180,0800,0000,1235
 U 10F7, 0000,003C,0580,0800,0084,B233
 U 1235, 0C00,003C,0180,0800,0000,10DC
 U 10DC, 0000,193D,0180,0800,0000,1090
 U 10DD, 0000,003C,6180,0800,0084,7236
 U 1236, 0000,003C,0180,0868,0000,1237
 U 1237, 0000,003C,0180,09E8,0010,1238
 U 1238, 0018,0038,1180,09F8,0000,1239
 U 1239, 0003,003C,0180,09F0,0000,123A
 U 123A, 0018,0138,1D80,09E0,0000,10E0
 U 10E0, 0001,203D,0180,09D8,0000,1109
 U 10E1, 000C,0038,0180,09E8,0010,123B
 U 123B, 0000,013C,0180,0800,0000,10E4
 U 10E4, 0001,203D,0180,09D8,0000,1109
 U 10E5, 0000,0C3C,0180,0800,0000,10FB
 U 10FB, 0000,003C,0180,0800,0000,123C
 U 10FF, 0000,003C,0580,0800,0084,B236
 U 123C, 0001,203C,0180,0800,0010,123D
 U 123D, 0000,013C,0180,0800,0000,10E8

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U 10E8, 0019,2000,05C0,0800,0000,10DB :2339 =0 Q,Q-K[.1],J/RABT2 ; IF NOT CONTINUE
U 10E9, 0000,003C,0180,0800,0000,123E :2340 J7RABT7
:2341 ; THIS IS A TABLE OF FUNCTIONS WHICH SHOULD NOT WRITE INTO ANY
:2342 ; OF THE RA OR RB REGISTERS. TESTING THESE FUNCTIONS WILL INSURE
:2343 ; THAT THE RA AND RB REGISTERS ARE NOT WRITTEN WHEN THEY SHOULD
:2344 ; NOT BE WRITTEN:
:2345 =0000
U 1090, 001B,0002,0580,0A00,0000,0001 :2346 RTAB3: ALU_0-K[.1],SPO/40,RETURN1 ; LOAD LAB[R0-RF]
U 1091, 001B,0002,0580,09C0,0000,0001 :2347 ALU_0-K[.1],SPO/38,RETURN1 ; WRITE RC[T8-TF]
U 1092, 001B,0002,0580,0840,0000,0001 :2348 ALU_0-K[.1],SPO/08,RETURN1 ; LOAD LAB[ACN]
U 1093, 001B,0002,0580,0880,0000,0001 :2349 ALU_0-K[.1],SPO/10,RETURN1 ; LOAD LA[R0-R7]
U 1094, 001B,0002,0580,0B00,0000,0001 :2350 ALU_0-K[.1],SPO/60,RETURN1 ; LOAD LAB[R1] AND WRITE RC[T0-TF]
:2351 =
U 123E, 0000,003C,0180,0800,0000,10EC :2352 RABT7: NOP
```

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:2353 .PAGE "TEST 82 WRITE RC CONTROL LOGIC TEST"
:2354 *****
:2355 ++
:2356 TEST 82 WRITE RC CONTROL LOGIC TEST
:2357
:2358 TEST DESCRIPTION
:2359 THIS IS A TEST OF THE WRITE RC CONTROL LOGIC. THIS
:2360 TEST INSURES THAT THE RC SCRATCH PADS ARE NOT WRITTEN WHEN
:2361 THEY ARE NOT SUPPOSED TO BE WRITTEN.
:2362
:2363 ERROR DESCRIPTION
:2364 EXPECTED DATA
:2365 ACTUAL DATA
:2366 REGISTER ADDRESS
:2367 FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED RC)
:2368 AS GIVEN BY:
:2369 7 SPO/70
:2370 6 SPO/06
:2371 5 SPO/05
:2372 4 SPO/03
:2373 3 SPO/0F
:2374 2 SPO/17
:2375 1 SPO/27
:2376 0 SPO/47
:2377
:2378 --
:2379 *****
:2380 =0
:2381 RCT: NEWTST
:2382 Q_K[.7] ; SET UP A COUNTER USED FOR THIS TEST
:2383 =0 ERLOOP
:2384 RCT1: SC_K[.F] ; WRITE 0 INTO ALL THE RC REGISTERS
:2385 RCT2: ALD_Q(K),RC(SC)_ALU
:2386 SC_NE_0?
:2387 =011 J/RCT3
:2388 SC_SC-K[.1],J/RCT2
:2389 RCT3: D_Q ; GO EXECUTE THE TEST INSTRUCTION
:2390 =0 D3-0?,CALL,J/RTAB4 ; WHICH SHOULD NOT WRITE INTO RC
:2391 SC_K[.F] ; READ BACK ALL THE RC REGISTERS
:2392 RCT4: LC_RC(SC) ; TO INSURE NONE WERE MODIFIED
:2393 D_[C,CLK.UBCC
:2394 Z?
:2395 =0 J/RCT45
:2396 J/RCT46
:2397 RCT45: RC[OD]_D ; SAVE DATA FOR ERROR PRINT OUT
:2398 RC[OE]_0
:2399 RC[OF]_K[.4]
:2400 ALU_SC,RC[OC]_ALU
:2401 =0 RC[OB]_Q,ERROR1 ; AN RC REGISTER WAS WRITTEN BY
:2402 ; A REGISTER FUNTION WHICH SHOULD NOT
:2403 ; HAVE DONE A WRITE TO RC
:2404 RCT46: SC_NE_0? ; CHECKED ALL REGISTERS?
:2405 =011 J/RCT5
:2406 SC_SC-K[.1],J/RCT4 ; IF NOT READ NEXT RC REGISTER
:2407 RCT5: ALD_Q,CLK.UBCC ; TRIED ALL TEST FUNCTIONS

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U 10EC, 0000,003D,0180,0800,0000,108E
U 10ED, 0018,0038,5DC0,0800,0000,10F0
U 10F0, 0000,003D,0180,0800,0000,10FE
U 10F1, 0000,003C,6180,0800,0084,723F
U 123F, 0018,0038,1980,0838,0000,1240
U 1240, 0000,0C3C,0180,0800,0000,1113
U 1113, 0000,003C,0180,0800,0000,1241
U 1117, 0000,003C,0580,0800,0084,B23F
U 1241, 0C00,003C,0180,0800,0000,10F4
U 10F4, 0000,193D,0180,0800,0000,10A0
U 10F5, 0000,003C,6180,0800,0084,7242
U 1242, 0000,003C,0180,0830,0000,1243
U 1243, 0810,0038,0180,0800,0010,1244
U 1244, 0000,013C,0180,0800,0000,10F8
U 10F8, 0000,003C,0180,0800,0000,1245
U 10F9, 0000,003C,0180,0800,0000,10FD
U 1245, 0001,003C,0180,09E8,0000,1246
U 1246, 0003,003C,0180,09F0,0000,1247
U 1247, 0018,0038,1180,09F8,0000,1248
U 1248, 0018,0038,1D80,09E0,0000,10FC
U 10FC, 0001,203D,0180,09D8,0000,1109

U 10FD, 0000,0C3C,0180,0800,0000,111B
U 111B, 0000,003C,0180,0800,0000,1249
U 111F, 0000,003C,0580,0800,0084,B242
U 1249, 0001,203C,0180,0800,0010,124A


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U 124A, 0000,013C,0180,0800,0000,110A :2408
U 110A, 0019,2000,05C0,0800,0000,10F1 :2409
U 110B, 0000,003C,0180,0800,0000,124B :2410
:2411
:2412
:2413
:2414
:2415
U 10A0, 001B,0002,0580,0A38,0000,0001 :2416
U 10A1, 001B,0002,0580,0938,0000,0001 :2417
U 10A2, 001B,0002,0580,08B8,0000,0001 :2418
U 10A3, 001B,0002,0580,0878,0000,0001 :2419
U 10A4, 001B,0002,0580,0818,0000,0001 :2420
U 10A5, 001B,0002,0580,0828,0000,0001 :2421
U 10A6, 001B,0002,0580,0830,0000,0001 :2422
U 10A7, 001B,0002,0580,0880,0000,0001 :2423
:2424
U 124B, 0000,003C,0180,0800,0000,1110 :2425

Z?
=0 Q Q-K[.1],J/RCT1 ; IF NOT CONTINUE
J7RCT6
; THIS IS A TABLE OF FUNCTIONS WHICH SHOULD NOT WRITE ANY OF THE RC
; REGISTERS. PROPER EXECUTION OF THESE FUNCTIONS WILL INSURE THAT THE
; RC REGISTERS ARE NOT WRITTEN BY FUNCTIONS WHICH SHOULD NOT WRITE THESE
; REGISTERS:
=0000
RTAB4: ALU_0-K[.1],SPO/47,RETURN1 ; LOAD LAB[R7]
ALU_0-K[.1],SPO/27,RETURN1 ; LOAD LC[T7]
ALU_0-K[.1],SPO/17,RETURN1 ; LOAD LA[R7]
ALU_0-K[.1],SPO/0F,RETURN1 ; LOAD LAB[ACN=7]
ALU_0-K[.1],SPO/03,RETURN1 ; NOP
ALU_0-K[.1],SPO/05,RETURN1 ; NOP
ALU_0-K[.1],SPO/06,RETURN1 ; LOAD RC[SC]
ALU_0-K[.1],SPO/70,RETURN1 ; LOAD LC[TO-TF] AND WRITE RAB[R1]
=
RCT6: NOP
```

```

:2426 .PAGE "TEST 83 VA, PC AND BMX/PC TEST"
:2427 *****
:2428 **
:2429 TEST 83 VA, PC AND BMX/PC TEST
:2430
:2431 TEST DESCRIPTION
:2432 THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
:2433 LOAD FUNCTION AND THE BMX PC INPUTS.
:2434
:2435 ERROR DESCRIPTION
:2436 EXPECTED DATA
:2437 ACTUAL DATA
:2438
:2439 --
:2440 *****
:2441 =0
:2442 VAPC1: NEWTST
:2443 RC[0F],K[.2]
:2444 RC[3],K[.1F]
:2445 =0 ERLOOP
:2446 VAPC1A: SC RC[3]
:2447 ALU_MASK,VA_ALU,Q_ALU,RC[0E]_ALU ; LOAD VA
:2448 ALU_0(K) ; CHANGE INPUT DATA TO VA.
:2449 PCK7PC VA ; LOAD PC
:2450 ALU_0(R),VA_ALU ; CHANGE INPUT DATA TO PC
:2451 BMX7PC,ALU/B,D_ALU,RC[0D]_ALU ; READ PC THROUGH BMX
:2452 ALU_Q-D,CLK.UBCC ; IS IT CORRECT?
:2453 Z?
:2454 =0 ERROR1
:2455 ALU_NOT.MASK,VA_ALU,Q_ALU,RC[0E]_ALU ; LOAD VA
:2456 ALU_0-K[.1] ; CHANGE INPUT DATA TO VA
:2457 PCK7PC VA ; LOAD PC
:2458 ALU_0-R[.1],VA_ALU ; CHANGE INPUT DATA TO PC
:2459 BMX7PC,ALU/B,D_ALU,RC[0D]_ALU ; READ PC THROUGH BMX
:2460 ALU_Q-D,CLK.UBCC ; IS IT CORRECT?
:2461 Z?
:2462 =0 ERROR1
:2463 ALU_RC[3],CLK.UBCC
:2464 Z?
:2465 =0 RC[3]_LA-K[.1],J/VAPC1A
:2466 NOP

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U 1110, 0000,003D,0180,0800,0000,108E
U 1111, 0018,0038,0980,09F8,0000,124C
U 124C, 0018,0038,8D80,0A98,0000,1114
U 1114, 0000,003D,0180,0800,0000,10FE
U 1115, 0000,003C,0180,0A18,0082,124D
U 124D, 0000,0038,01C0,09F0,0200,124E
U 124E, 0018,0038,1980,0800,0000,124F
U 124F, 0000,003C,0180,0801,0000,1250
U 1250, 0018,0038,1980,0800,0200,1251
U 1251, 0814,0038,0180,09E8,0000,1252
U 1252, 001D,2000,0180,0800,0010,1253
U 1253, 0000,013C,0180,0800,0000,1118
U 1118, 0000,003D,0180,0800,0000,1109
U 1119, 0003,001C,01C0,09F0,0200,1254
U 1254, 001B,0000,0580,0800,0000,1255
U 1255, 0000,003C,0180,0801,0000,1256
U 1256, 001B,0000,0580,0800,0200,1257
U 1257, 0814,0038,0180,09E8,0000,1258
U 1258, 001D,2000,0180,0800,0010,1259
U 1259, 0000,013C,0180,0800,0000,111C
U 111C, 0000,003D,0180,0800,0000,1109
U 111D, 0000,003C,0180,0A18,0010,125A
U 125A, 0000,013C,0180,0800,0000,1120
U 1120, 0018,0000,0580,0A98,0000,1115
U 1121, 0000,003C,0180,0800,0000,1122

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		:2467	.PAGE "TEST 84 VA INCREMENT FUNCTION TEST"
		:2468	:*****
		:2469	:++
		:2470	TEST 84 VA INCREMENT FUNCTION TEST
		:2471	
		:2472	TEST DESCRIPTION
		:2473	THIS IS TEST OF THE VA REGISTER INCREMENT FUNCTION, THE PC
		:2474	LOAD FUNCTION AND THE BMX PC INPUTS.
		:2475	
		:2476	ERROR DESCRIPTION
		:2477	EXPECTED RESULT
		:2478	ACTUAL RESULT
		:2479	:
		:2480	--
		:2481	:*****
		:2482	=0
U 1122,	0000,003D,0180,0800,0000,108E	:2483	VAPC2: NEWTST
U 1123,	0018,0038,0980,09F8,0000,125B	:2484	RC[0F],K[.2]
U 125B,	0018,0038,8D80,0A98,0000,1124	:2485	R[3],K[.1F]
U 1124,	0000,003D,0180,0800,0000,10FE	:2486	=0 ERLOOP
U 1125,	0000,003C,0180,0A18,0082,125C	:2487	VAPC2A: SC R[3]
U 125C,	0000,0038,01C0,0800,0200,125D	:2488	ALU MASK,VA_ALU,Q_ALU ; LOAD TEST PATTERN INTO VA
U 125D,	0000,003C,0180,0803,0000,125E	:2489	PCK7VA+4 ; INCREMENT VA BY 4.
U 125E,	0000,003C,0180,0801,0000,125F	:2490	PCK/PC_VA ; LOAD VA INTO PC
U 125F,	0814,0038,0180,09E8,0000,1260	:2491	BMX/PC,ALU/B,D ALU,R[C0D] ALU ; READ PC THROUGH BMX
U 1260,	0019,2014,11C0,09F0,0000,1261	:2492	ALU_Q+K[.4],Q ALU,R[C0E] ALU ; COMPUTE EXPECTED RESULT
U 1261,	001D,2000,0180,0800,0010,1262	:2493	ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 1262,	0000,013C,0180,0800,0000,1126	:2494	Z?
U 1126,	0000,003D,0180,0800,0000,1109	:2495	=0 ERROR1
U 1127,	0003,001C,01C0,0800,0200,1263	:2496	ALU NOT MASK,VA_ALU,Q_ALU ; LOAD VA
U 1263,	0000,003C,0180,0803,0000,1264	:2497	PCK7VA+4 ; INCREMENT VA BY 4
U 1264,	0000,003C,0180,0801,0000,1265	:2498	PCK/PC_VA ; LOAD VA INTO PC
U 1265,	0814,0038,0180,09E8,0000,1266	:2499	BMX/PC,ALU/B,D ALU,R[C0D] ALU ; READ PC THROUGH BMX
U 1266,	0019,2014,11C0,09F0,0000,1267	:2500	ALU_Q+K[.4],Q ALU,R[C0E] ALU ; COMPUTE EXPECTED RESULT
U 1267,	001D,2000,0180,0800,0010,1268	:2501	ALU_Q-D,CLK.UBCC ; IS IT CORRECT?
U 1268,	0000,013C,0180,0800,0000,1128	:2502	Z?
U 1128,	0000,003D,0180,0800,0000,1109	:2503	=0 ERROR1
U 1129,	0000,003C,0180,0A18,0010,1269	:2504	ALU_R[3],CLK.UBCC
U 1269,	0000,013C,0180,0800,0000,112A	:2505	Z?
U 112A,	0018,0000,0580,0A98,0000,1125	:2506	=0 R[3]_LA-K[.1],J/VAPC2A
U 112B,	0000,003C,0180,0800,0000,112C	:2507	NOP

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:2508 .PAGE "TEST 85 PC INCREMENT BY 1 TEST"
:2509 *****
:2510 ++
:2511 TEST 85 INCREMENT PC BY 1 TEST
:2512
:2513 TEST DESCRIPTION
:2514 THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
:2515 INCREMENT BY 1 FUNCTION AND THE BMX PC INPUTS.
:2516
:2517 ERROR DESCRIPTION
:2518 EXPECTED RESULT
:2519 ACTUAL RESULT
:2520
:2521 --
:2522 *****
:2523 =0
:2524 VAPC3: NEWTST
:2525 RC[0F] K[.2]
:2526 R[3] K[.1F]
:2527 =0 ERLOOP
:2528 VAPC3A: SC R[3]
:2529 ALU MASK,VA_ALU,Q_ALU ; LOAD VA
:2530 PCK7PC_VA ; LOAD VA INTO PC
:2531 PCK/PC+1 ; INCREMENT PC BY 1
:2532 BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ PC THROUGH BMX
:2533 ALU_Q+K[.1],Q ALU,RC[0E] ALU ; COMPUTE EXPECTED RESULT
:2534 ALU_Q-D,CLK.UBCC ; ACTUAL RESULT CORRECT?
:2535 Z?
:2536 =0 ERROR1
:2537 ALU NOT.MASK,VA_ALU,Q_ALU ; LOAD VA
:2538 PCK7PC_VA ; LOAD VA INTO PC
:2539 PCK/PC+1 ; INCREMENT THE PC BY 1
:2540 BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
:2541 ALU_Q+K[.1],Q ALU,RC[0E] ALU ; COMPUTE THE EXPECTED RESULT
:2542 ALU_Q-D,CLK.UBCC ; WAS THE ACTUAL RESULT CORRECT?
:2543 Z?
:2544 =0 ERROR1
:2545 ALU_R[3],CLK.UBCC
:2546 Z?
:2547 =0 R[3]_LA-K[.1],J/VAPC3A
:2548 NOP

```

```

U 112C, 0000,003D,0180,0800,0000,108E
U 112D, 0018,0038,0980,09F8,0000,126A
U 126A, 0018,0038,8D80,0A98,0000,112E
U 112E, 0000,003D,0180,0800,0000,10FE
U 112F, 0000,003C,0180,0A18,0082,126B
U 126B, 0000,0038,01C0,0800,0200,126C
U 126C, 0000,003C,0180,0801,0000,126D
U 126D, 0000,003C,0180,0804,0000,126E
U 126E, 0814,0038,0180,09E8,0000,126F
U 126F, 0019,2014,05C0,09F0,0000,1270
U 1270, 001D,2000,0180,0800,0010,1271
U 1271, 0000,013C,0180,0800,0000,1130
U 1130, 0000,003D,0180,0800,0000,1109
U 1131, 0003,001C,01C0,0800,0200,1272
U 1272, 0000,003C,0180,0801,0000,1273
U 1273, 0000,003C,0180,0804,0000,1274
U 1274, 0814,0038,0180,09E8,0000,1275
U 1275, 0019,2014,05C0,09F0,0000,1276
U 1276, 001D,2000,0180,0800,0010,1277
U 1277, 0000,013C,0180,0800,0000,1132
U 1132, 0000,003D,0180,0800,0000,1109
U 1133, 0000,003C,0180,0A18,0010,1278
U 1278, 0000,013C,0180,0800,0000,1134
U 1134, 0018,0000,0580,0A98,0000,112F
U 1135, 0000,003C,0180,0800,0000,1136

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CCCCCCCCCCCCCCCCCCCC


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:2549
:2550
:2551
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:2553
:2554
:2555
:2556
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:2558
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:2561
:2562
:2563
:2564
U 1136, 0000,003D,0180,0800,0000,108E
U 1137, 0018,0038,0980,09F8,0000,1279
U 1279, 0018,0038,8D80,0A98,0000,1138
U 1138, 0000,003D,0180,0800,0000,10FE
U 1139, 0000,003C,0180,0A18,0082,127A
U 127A, 0000,0038,01C0,0800,0200,127B
U 127B, 0000,003C,0180,0801,0000,127C
U 127C, 0000,003C,0180,0805,0000,127D
U 127D, 0814,0038,0180,09E8,0000,127E
U 127E, 0019,2014,09C0,09F0,0000,127F
U 127F, 001D,2000,0180,0800,0010,1280
U 1280, 0000,013C,0180,0800,0000,113A
U 113A, 0000,003D,0180,0800,0000,1109
U 113B, 0003,001C,01C0,0800,0200,1281
U 1281, 0000,003C,0180,0801,0000,1282
U 1282, 0000,003C,0180,0805,0000,1283
U 1283, 0814,0038,0180,09E8,0000,1284
U 1284, 0019,2014,09C0,09F0,0000,1285
U 1285, 001D,2000,0180,0800,0010,1286
U 1286, 0000,013C,0180,0800,0000,113C
U 113C, 0000,003D,0180,0800,0000,1109
U 113D, 0000,003C,0180,0A18,0010,1287
U 1287, 0000,013C,0180,0800,0000,113E
U 113E, 0018,0000,0580,0A98,0000,1139
U 113F, 0000,003C,0180,0800,0000,1140

```

```

.PAGE "TEST 86 PC INCREMENT BY 2 TEST"
*****
++
TEST 86 PC INCREMENT BY 2 TEST
TEST DESCRIPTION
THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
INCREMENT BY 2 FUNCTION AND THE BMX PC INPUTS.
ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT
--
*****
=0
VAPC4: NEWTST
RC[0F] K[.2]
RC[3] K[.1F]
=0
ERLOOP
VAPC4A: SC R[3]
ALU_MASK,VA_ALU,Q_ALU ; LOAD THE VA
PCK7PC VA ; LOAD THE VA INTO THE PC
PCK/PC+2 ; INCREMENT THE PC BY 2
BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q+K[.2],Q ALU,RC[0E] ALU ; COMPUTE THE EXPECTED RESULT
ALU_Q-D,CLK.UBCC ; WAS THE ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VA
PCK7PC VA ; LOAD THE VA INTO THE PC
PCK/PC+2 ; INCREMENT THE PC BY 2
BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q+K[.2],Q ALU,RC[0E] ALU ; COMPUTE THE EXPECTED RESULT
ALU_Q-D,CLK.UBCC ; WAS THE ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
ALU_R[3],CLK.UBCC
Z?
=0
R[3]_LA-K[.1],J/VAPC4A
NOP

```

```

:2590
:2591
:2592
:2593
:2594
:2595
:2596
:2597
:2598
:2599
:2600
:2601
:2602
:2603
:2604
:2605
:2606
:2607
:2608
:2609
:2610
:2611
:2612
:2613
:2614
:2615
:2616
:2617
:2618
:2619
:2620
:2621
:2622
:2623
:2624
:2625
:2626
:2627
:2628
:2629
:2630
U 1140, 0000,003D,0180,0800,0000,108E
U 1141, 0018,0038,0980,09F8,0000,1288
U 1288, 0018,0038,8D80,0A98,0000,1142
U 1142, 0000,003D,0180,0800,0000,10FE
U 1143, 0000,003C,0180,0A18,0082,1289
U 1289, 0000,0038,01C0,0800,0200,128A
U 128A, 0000,003C,0180,0801,0000,128B
U 128B, 0000,003C,0180,0806,0000,128C
U 128C, 0814,0038,0180,09E8,0000,128D
U 128D, 0019,2014,11C0,09F0,0000,128E
U 128E, 001D,2000,0180,0800,0010,128F
U 128F, 0000,013C,0180,0800,0000,1144
U 1144, 0000,003D,0180,0800,0000,1109
U 1145, 0003,001C,01C0,0800,0200,1290
U 1290, 0000,003C,0180,0801,0000,1291
U 1291, 0000,003C,0180,0806,0000,1292
U 1292, 0814,0038,0180,09E8,0000,1293
U 1293, 0019,2014,11C0,09F0,0000,1294
U 1294, 001D,2000,0180,0800,0010,1295
U 1295, 0000,013C,0180,0800,0000,1146
U 1146, 0000,003D,0180,0800,0000,1109
U 1147, 0000,003C,0180,0A18,0010,1296
U 1296, 0000,013C,0180,0800,0000,1148
U 1148, 0018,0000,0580,0A98,0000,1143
U 1149, 0000,003C,0180,0800,0000,114A

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.PAGE "TEST 87 PC INCREMENT BY 4 TEST"
*****
++
TEST 87 INCREMENT PC BY 4 TEST

TEST DESCRIPTION
THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
INCREMENT BY 4 FUNCTION AND THE BMX PC INPUTS.

ERROR DESCRIPTION
EXPECTED RESULT
ACTUAL RESULT

--
*****
=0
VAPC5: NEWTST
RC[0F],K[.2]
R[3],K[.1F]
=0
ERLOOP
VAPC5A: SC R[3]
ALU_MASK,VA_ALU,Q_ALU ; LOAD THE VA
PCK7PC_VA ; LOAD THE VA INTO THE PC
PCK/PC+4 ; INCREMENT THE PC BY 4
BMX/PC,ALU/B,D,ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q+K[.4],Q,ALU,RC[0E] ALU ; COMPUTE THE EXPECTED RESULT
ALU_Q-D,CLK,UBCC ; WAS THE ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VA
PCK7PC_VA ; LOAD THE VA INTO THE PC
PCK/PC+4 ; INCREMENT THE PC BY 4
BMX/PC,ALU/B,D,ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q+K[.4],Q,ALU,RC[0E] ALU ; COMPUTE THE EXPECTED RESULT
ALU_Q-D,CLK,UBCC ; WAS THE ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
ALU_R[3],CLK,UBCC
Z?
=0
R[3]_LA-K[.1],J/VAPC5A
NOP

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:2631
:2632
:2633
:2634
:2635
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:2637
:2638
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:2640
:2641
:2642
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:2644
:2645
:2646
:2647
:2648
:2649
:2650
:2651
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:2659
:2660
:2661
:2662
:2663
:2664
:2665
:2666
:2667
:2668
:2669
:2670
U 114A, 0000,003D,0180,0800,0000,108E
U 114B, 0D18,0038,0980,09F8,0000,1297
U 1297, 0018,0038,8D80,0A98,0000,114C
U 114C, 0000,003D,0180,0800,0000,10FE
U 114D, 0000,003C,0180,0A18,0082,1298
U 1298, 2000,0038,01C0,0800,0200,1299
U 1299, 0018,0038,1980,0800,0200,129A
U 129A, 0000,003C,0180,0802,0000,129B
U 129B, 0814,0038,0180,09E8,0000,129C
U 129C, 0019,2024,0DC0,09F0,0000,129D
U 129D, 001D,2000,0180,0800,0010,129E
U 129E, 0000,013C,0180,0800,0000,114E
U 114E, 0000,003D,0180,0800,0000,1109
U 114F, 2003,001C,01C0,0800,0200,129F
U 129F, 001B,0000,0580,0800,0200,12A0
U 12A0, 0000,003C,0180,0802,0000,12A1
U 12A1, 0814,0038,0180,09E8,0000,12A2
U 12A2, 0019,2024,0DC0,09F0,0000,12A3
U 12A3, 001D,2000,0180,0800,0010,12A4
U 12A4, 0000,013C,0180,0800,0000,1150
U 1150, 0000,003D,0180,0800,0000,1109
U 1151, 0000,003C,0180,0A18,0010,12A5
U 12A5, 0000,013C,0180,0800,0000,1152
U 1152, 001B,0000,0580,0A98,0000,114D
U 1153, 0000,003C,0180,0800,0000,1156

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.PAGE "TEST 88 VIBA TEST"
*****
++
TEST 88 VIBA TEST
THIS IS A TEST OF THE VIBA. A FLUSH IS DONE
INORDER TO LOAD THE VIBA, THEN THE DATA IS LOADED INTO THE
PC AND READ BACK THROUGH THE BMX.

ERROR DESCRIPTION
EXPECTED DATA
ACTUAL DATA

--
*****
=0
VAPC6: NEWTST
RC[0F] K[.2]
R[3] K[.1F]
=0
ERLOOP
VAPC6A: SC R[3]
IBC/FLUSH,ALU MASK,VA_ALU,Q_ALU ; LOAD VIBA
ALU 0(K),VA_ALU
PCK7PC_IBA ; LOAD THE VIBA INTO THE PC
BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q[ANDNOT]K[.3],R[0E] ALU,Q_ALU ; COMPUTE EXPECTED RESULT
ALU_Q-D,CLK.UBCC ; WAS ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
IBC/FLUSH,ALU NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VIBA
ALU 0-K[.1],VA_ALU
PCK7PC_IBA ; LOAD THE VIBA INTO THE PC
BMX/PC,ALU/B,D ALU,RC[0D] ALU ; READ THE PC THROUGH THE BMX
ALU_Q[ANDNOT]K[.3],Q_ALU,R[0E] ALU ; COMPUTE EXPECTED RESULT
ALU_Q-D,CLK.UBCC ; WAS ACTUAL RESULT CORRECT?
Z?
=0
ERROR1
ALU_R[3],CLK.UBCC
Z?
=0
R[3]_LA-K[.1],J/VAPC6A
NOP

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:2671
:2672
:2673
:2674
:2675
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:2677
:2678
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:2680
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:2682
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:2705
:2706
:2707
:2708
:2709
:2710
:2711
:2712
:2713
:2714
:2715
:2716
U 1156, 0000,003D,0180,0800,0000,108E
U 1157, 0000,003C,0180,0800,0084,72A6
U 12A6, 0803,0010,0180,0800,0000,12A7
U 12A7, 0801,0028,0180,0AA0,0000,12A8
U 12A8, 0018,0038,0980,09F8,0000,12A9
U 12A9, 0018,0038,8D80,0A98,0000,1158
U 1158, 0000,003D,0180,0800,0000,10FE
U 1159, 0000,003C,0180,0A18,0082,12AB
U 12AB, 0000,0038,01C0,0A20,0200,12AC
U 12AC, 001C,0034,01C0,09F0,0000,12AD
U 12AD, 0000,003C,0180,0801,0000,12AE
U 12AE, 0000,003C,0180,0800,1000,12AF
U 12AF, 0800,0038,0180,0A20,1C00,12B0
U 12B0, 081C,2034,0180,09E8,0000,12B1
U 12B1, 001D,2000,0180,0800,0010,12B2
U 12B2, 0000,013C,0180,0800,0000,115A
U 115A, 0000,003D,0180,0800,0000,1109
U 115B, 0003,001C,01C0,0A20,0200,12B3
U 12B3, 001C,0034,01C0,09F0,0000,12B4
U 12B4, 0000,003C,0180,0801,0000,12B5
U 12B5, 0000,003C,0180,0800,1000,12B6
U 12B6, 0800,0038,0180,0A20,1C00,12B7
U 12B7, 081C,2034,0180,09E8,0000,12B8
U 12B8, 001D,2000,0180,0800,0010,12B9
U 12B9, 0000,013C,0180,0800,0000,115C
U 115C, 0000,003D,0180,0800,0000,1109
U 115D, 0000,003C,0180,0A18,0010,12BA
U 12BA, 0000,013C,0180,0800,0000,115E
U 115E, 0018,0000,0580,0A98,0000,1159
U 115F, 0000,003C,0180,0800,0000,1160

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.PAGE "TEST 89 PCSV REGISTER TEST"
*****
++
TEST 89 PCSV REGISTER TEST

TEST DESCRIPTION
THIS IS A TEST OF THE PCSV REGISTER AND THE CONTROLS
OF THE UMSC FIELD WHICH LOAD AND READ IT, IRD AND READ.RLOG.

ERROR DESCRIPTION
EXPECTED DATA
ACTUAL DATA (RLOG BITS MASKED OFF!)

--
*****
=0
PC1: NEWTST
SC K[.8]
ALU MASK+1,D_ALU
D NOT,D,R[4]_ALU
R[0F] K[.2]
R[3] K[.1F]
=0
PC1A: SC R[3]
ALU MASK,VA,ALU,Q_ALU,LAB_R[4] ; LOAD VA
ALU_LA[AND]Q,Q_ALU,R[0E]_ALU ; COMPUTE EXPECTED RESULT
PCK7PC VA ; LOAD VA INTO PC
MSC/IRD ; LOAD PCSV REGISTER
MSC/READ.RLOG,ALU/B,D_ALU,LAB_R[4] ; READ PCSV
ALU_LA[AND]D,D_ALU,R[0D]_ALU ; MASK OFF RLOG STACK DATA
ALU_Q-D,CLK.UBCC ; WAS PCSV CORRECT?
Z?
=0
ERROR1
ALU_NOT.MASK,VA,ALU,Q_ALU,LAB_R[4] ; LOAD VA
ALU_LA[AND]Q,Q_ALU,R[0E]_ALU ; COMPUTE EXPECTED RESULT
PCK7PC VA ; LOAD VA INTO PC
MSC/IRD ; LOAD PCSV REGISTER
MSC/READ.RLOG,ALU/B,D_ALU,LAB_R[4] ; READ PCSV
ALU_LA[AND]D,D_ALU,R[0D]_ALU ; MASK OFF RLOG STACK BITS
ALU_Q-D,CLK.UBCC ; WAS PC SAVE CORRECT?
Z?
=0
ERROR1
ALU_R[3],CLK.UBCC
Z?
=0
R[3]_LA-K[.1],J/PC1A
NOP

```



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:2717 .PAGE "TEST 8A BEN RLOG STACK EMPTY TEST"
:2718 *****
:2719 ++
:2720 TEST 8A BEN RLOG STACK EMPTY TEST
:2721
:2722 TEST DESCRIPTION
:2723 THIS IS A TEST OF THE RLOG STACK POINTER INCREMENT AND
:2724 DECREMENT FUNCTION USING THE BEN 15 BIT WHICH SIGNIFIES
:2725 RLOG DONE (RLOG STACK POINTER=0).
:2726
:2727 ERROR DESCRIPTION
:2728 EXPECTED STACK POINTER VALUE
:2729
:2730 --
:2731 *****
:2732 =0
:2733 RLOGB1: NEWTST
:2734 RC[0F] K[.1]
:2735 MSC/IRD ; MSC/IRD WILL CLEAR THE RLOG STACK POINTER
:2736 RC[0E] K[ZERO]
:2737 RLOG.EMPTY? ; BRANCH BIT=1
:2738 =0111 ERROR1 ; RLOG EMPTY BRANCH BIT INCORRECT
:2739 ; WITH RLOG STACK=0
:2740
:2741 D 0
:2742 CALL,J/DCE
:2743 R[1] D ; SET UP A COUNTER, R[1]=0E
:2744 RLOGB2: ALU/A-B.RLOG ; INCREMENT THE RLOG STACK POINTER
:2745 D R[1] ; FROM 1 TO 0F AND TEST THE RLOG
:2746 Q-K[F] ; STACK POINTER=0 BRANCH FOR EACH VALUE
:2747 ALU Q-D,RC[0E]_ALU
:2748 RLOG.EMPTY? ; BRANCH BIT=0
:2749 =0111 J/RLOGB3 ; RLOG STACK POINTER=0 U BRANCH FAILED
:2750 ERROR1 ; WITH STACK POINTER NOT 0
:2751
:2752 RLOGB3: ALU_R[1],CLK.UBCC
:2753 Z?
:2754 =0 R[1]_LA-K[.1],J/RLOGB2
:2755 ALU/A-B.RLOG ; INCREMENT THE STACK POINTER FROM 0F TO 00
:2756 RC[0E] K[ZERO]
:2757 RLOG.EMPTY? ; BRANCH BIT=1
:2758 =0111 ERROR1 ; RLOG STACK U BRANCH FAILED WITH
:2759 ; STACK POINTER=0
:2760
:2761 D 0
:2762 CALL,J/DCE
:2763 R[1] D ; SET UP A COUNTER, R[1]=0E
:2764 RLOGB4: ALU RLOG ; DECREMENT THE RLOG STACK POINTER
:2765 D R[1] ; FROM 0F TO 1 AND CHECK THE
:2766 ALU D+K[.1],RC[0E]_ALU ; BRANCH BIT FOR EACH VALUE
:2767 RLOG.EMPTY? ; BRANCH BIT=0
:2768 =0111 J/RLOGB5 ; BRANCH BIT INCORRECT WITH
:2769 ERROR1 ; STACK POINTER NOT 0
:2770
:2771 RLOGB5: ALU_R[1],CLK.UBCC
:2772 Z?
:2773 =0 R[1]_LA-K[.1],J/RLOGB4

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U 1160, 0000,003D,0180,0800,0000,108E
U 1161, 0018,0038,0580,09F8,0000,12BB
U 12BB, 0000,003C,0180,0800,1000,12BC
U 12BC, 0018,0038,1980,09F0,0000,12BD
U 12BD, 0000,153C,0180,0800,0000,1007
U 1007, 0000,003D,0180,0800,0000,1109
U 100F, 0F00,003C,0180,0800,0000,1162
U 1162, 0000,003D,0180,0800,0000,101E
U 1163, 0001,003C,0180,0A88,0000,12BE
U 12BE, 0000,0004,0180,0800,0000,12BF
U 12BF, 0800,003C,0180,0A08,0000,12C0
U 12C0, 0018,0038,61C0,0800,0000,12C1
U 12C1, 001D,2000,0180,09F0,0000,12C2
U 12C2, 0000,153C,0180,0800,0000,1047
U 1047, 0000,003C,0180,0800,0000,12C3
U 104F, 0000,003D,0180,0800,0000,1109
U 12C3, 0000,003C,0180,0A08,0010,12C4
U 12C4, 0000,013C,0180,0800,0000,1164
U 1164, 0018,0000,0580,0A88,0000,12BE
U 1165, 0000,0004,0180,0800,0000,12C5
U 12C5, 0018,0038,1980,09F0,0000,12C6
U 12C6, 0000,153C,0180,0800,0000,1057
U 1057, 0000,003D,0180,0800,0000,1109
U 105F, 0F00,003C,0180,0800,0000,1166
U 1166, 0000,003D,0180,0800,0000,101E
U 1167, 0001,003C,0180,0A88,0000,12C7
U 12C7, 0000,0038,0180,0800,1C00,12C8
U 12C8, 0800,003C,0180,0A08,0000,12C9
U 12C9, 0019,0014,0580,09F0,0000,12CA
U 12CA, 0000,153C,0180,0800,0000,1077
U 1077, 0000,003C,0180,0800,0000,12CB
U 107F, 0000,003D,0180,0800,0000,1109
U 12CB, 0000,003C,0180,0A08,001D,12CC
U 12CC, 0000,013C,0180,0800,0000,1168
U 1168, 0018,0000,0580,0A88,0000,12C7

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ESKAH25.MCR MICRO2 1M(01) 16-DEC-82 11:01:45

U 1169.	0000,0038,0180,0800,1C00,12CD	:2772	ALU RLOG
U 12CD.	0018,0038,1980,09F0,0000,12CE	:2773	RC[OE] K[ZERO]
U 12CE.	0000,153C,0180,0800,0000,1097	:2774	RLOG.EMPTY?
U 1097.	0000,003D,0180,0800,0000,1109	:2775	ERROR1
		:2776	=0111
U 109F.	0000,0038,0180,0800,1C00,12CF	:2777	ALU RLOG
U 12CF.	0000,003C,0180,0800,1000,12D0	:2778	MSC7IRD
U 12D0.	0000,153C,0180,0800,0000,10B7	:2779	RLOG.EMPTY?
U 10B7.	0000,003D,0180,0800,0000,1109	:2780	ERROR1
U 10BF.	0000,003C,0180,0800,0000,116A	:2781	NOP
			=0111

```

: DECREMENT THE RLOG STACK POINTER FROM 1 TO 0
:
: BRANCH BIT=1
: BRANCH BIT INCORRECT WITH
: STACK POINTER=0
: DECREMENT THE STACK POINTER FROM 0 TO OF
: SHOULD PUT 0 INTO THE STACK POINTER
: BRANCH BIT SHOULD BE 1.
: MSC/IRD FAILED TO CLEAR RLOG STACK POINTER

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U 116A, 0000,003D,0180,0800,0000,108E
U 116B, 0003,003C,0180,0A98,0000,12D1
U 12D1, 0018,0038,1180,09F8,0000,12D2
U 12D2, 0018,0038,6180,0A90,0000,12D3
U 12D3, 0003,003C,0180,09D8,0000,116C
U 116C, 0000,003D,0180,0800,0000,10FE
U 116D, 0000,003C,0180,0800,0000,116E

U 116E, 0F00,003D,0180,0800,0000,11EB
U 116F, 0001,003C,0180,0801,0200,1170
U 1170, 0F00,003D,0180,0800,0000,101A
U 1171, 0000,003C,0180,0800,0000,1172
U 1172, 0000,003D,0180,0800,0000,101A
U 1173, 0001,003C,0180,0AE8,0000,12D4
U 12D4, 0000,003C,0180,0800,1000,12D5
U 12D5, 0F00,003C,0180,0800,0000,12D6
U 12D6, 0001,003C,0180,0800,0082,12D7
U 12D7, 0001,0004,1D80,0A00,0000,12D8
U 12D8, 0000,003C,0180,0A18,0000,12D9
U 12D9, 001C,2000,0180,0800,0010,12DA

U 12DA, 0000,013C,0180,0800,0000,1174
U 1174, 0819,0014,0580,0800,0000,12D6
U 1175, 0000,003C,0180,0A18,0000,12DB
U 12DB, 0003,003C,0180,09D8,0000,12DC

```
.PAGE "TEST 8B RLOG STACK TEST"
*****
++
TEST 8B RLOG STACK TEST

TEST DESCRIPTION
THIS IS A TEST OF THE RLOG STACK AND RLOG
STACK POINTER. THE WAY EACH LOCATION IN THE STACK
IS TESTED IS BY FIRST WRITING A COUNT PATTERN
INTO EACH OF THE LOCATIONS UP TO THE ONE IN
THE STACK WHICH IS BEING TESTED. THEN THAT LOCATION
BEING TESTED IS WRITTEN AND READ WITH MANY DATA
PATTERNS THEN AFTER CHECKING
EACH OF THESE PATTERNS THE STACK POINTER IS DECRIMENTED
DOWN TO 0 AND EACH OF THE OTHER LOCATIONS IS CHECKED TO
INSURE THAT THEY STILL CONTAIN THE COUNT PATTERN WHICH
WAS ORIGINALLY WRITTEN INTO THEM.

ERROR DESCRIPTION
EXPECTED DATA
GOT DATA
ADDRESS READ IN RLOG
0

--
*****
=0
RLOG: NEWTST
      RC[3] 0
      RC[0F] K[.4]
      RC[2] K[.F] ; INITIALIZE SOME COUNTERS.
      RC[0B] 0
=0 ERLOOP-
NOP

=0
RLOG1: D 0,CALL,J/DCAAAA ; SET UP THE PC
      PC&VA D ; PC=0000AAAA
=0 D 0,CALL,J/DCA
NOP
=0 CALL,J/DCA
      R[0D] D
      MSC/IRD ; CLEAR THE RLOG STACK POINTER
      D 0
RLOG2: SC D ; INCREMENT THE STACK POINTER
      LAB R[0],ALU/A-B.RLOG,K[SC],AMX/RAMX ; AND WRITE A COUNT
      LAB R[3] ; PATTERN INTO EACH STACK
      ALU_LA[A-B]D,CLK.UBCC ; LOCATIONS KMX FIELD
      ; THIS IS DONE FOR EACH
      ; LOCATION IN THE STACK ALL
      ; THE WAY UP TO AND INCLUDING
      ; THE LOCATION CURRENTLY BEING TESTED.

      Z?
=0 D D+K[.1],J/RLOG2
      LAB R[3]
      RC[0B] 0 ; GO COMPUTE THE EXPECTED
      ; DATA IN THE LOCATION
```



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U 12DC, 0000,003C,0180,09E0,0000,12DD :2837
U 12DD, 0000,003C,0180,0AD0,0000,12DE :2838
U 12DE, 0003,003C,0180,0AD8,0000,12DF :2839
U 12DF, 0003,003C,0180,0AE0,0000,1176 :2840
U 1176, 0000,003D,0180,0800,0000,11A4 :2841
U 1177, 0001,003C,0180,09F0,0000,12E0 :2842
U 12E0, 0000,0038,01C0,09E8,1C00,12E1 :2843
U 12E1, 001D,2000,0180,0800,0010,12E2 :2844
:2845
U 12E2, 0000,013C,0180,0800,0000,1178 :2846
U 1178, 0000,003D,0180,0800,0000,1109 :2847
:2848
:2849
U 1179, 0001,0004,6180,0A78,0000,12E3 :2850
:2851
U 12E3, 0018,0038,6180,0AD0,0000,12E4 :2852
U 12E4, 0018,0038,6180,0AD8,0000,12E5 :2853
U 12E5, 0003,003C,0180,0AE0,0000,117A :2854
U 117A, 0000,003D,0180,0800,0000,11A4 :2855
U 117B, 0001,003C,0180,09F0,0000,12E6 :2856
U 12E6, 0000,0038,01C0,09E8,1C00,12E7 :2857
U 12E7, 001D,2000,0180,0800,0010,12E8 :2858
U 12E8, 0000,013C,0180,0800,0000,117C :2859
U 117C, 0000,003D,0180,0800,0000,1109 :2860
U 117D, 0001,0018,1980,0A00,0000,12E9 :2861
:2862
U 12E9, 0003,003C,0180,0AD0,0000,12EA :2863
U 12EA, 0003,003C,0180,0AD8,0000,12EB :2864
U 12EB, 001B,0000,0580,0AE0,0000,117E :2865
U 117E, 0000,003D,0180,0800,0000,11A4 :2866
U 117F, 0001,003C,0180,09F0,0000,12EC :2867
U 12EC, 0000,0038,01C0,09E8,1C00,12ED :2868
U 12ED, 001D,2000,0180,0800,0010,12EE :2869
U 12EE, 0000,013C,0180,0800,0000,1180 :2870
U 1180, 0000,003D,0180,0800,0000,1109 :2871
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:2875
U 1181, 0018,0038,6180,0AB0,0000,12EF :2876
U 12EF, 0018,0038,1980,0AB8,0000,12F0 :2877
U 12F0, 0003,003C,0180,0AD8,0000,12F1 :2878
U 12F1, 0003,003C,0180,0AE0,0000,12F2 :2879
U 12F2, 0000,003C,0180,0A38,0082,12F3 :2880
U 12F3, 0000,003C,0180,0AD0,0000,12F4 :2881
U 12F4, 0001,0004,1D80,0A00,0000,1182 :2882
U 1182, 0000,003D,0180,0800,0000,11A4 :2883
U 1183, 0001,003C,0180,09F0,0000,12F5 :2884
U 12F5, 0000,0038,01C0,09E8,1C00,12F6 :2885
U 12F6, 001D,2000,0180,0800,0010,12F7 :2886
U 12F7, 0000,013C,0180,0800,0000,1184 :2887
U 1184, 0000,003D,0180,0800,0000,1109 :2888
U 1185, 0000,003C,0180,0A38,0000,12F8 :2889
U 12F8, 0018,0014,0580,0AB8,0000,12F9 :2890
U 12F9, 0000,003C,0180,0A30,0010,12FA :2891

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RC[OC] LA ; CURRENTLY BEING TESTED
R[OA] LA
R[OB] 0
R[OC] 0
=0 CALL J/COMRLG
RC[OE] D
ALU_RLOG,Q,ALU,RC[OD],ALU ; READ THE LOCATION BEING TEST AND
ALU_Q-D,CLR,UBCC ; CHECK THE RESULT: RA[0], ALU/A-B
; SC=STACK POINTER VALUE
Z?
=0 ERROR1 ; LOCATION BEING TEST DIDN'T
; READ OR GET WRITTEN
; WITH COUNT PATTERN.
RLOGA: ALU/A-B.RLOG,LAB_R[OF],K[F],AMX/RMX ; WRITE THE LOCATION BEING
; TESTED WITH: RA[OF], K[F] AND ALU/A-B
; COMPUTE THE EXPECTED RESULT
R[OA] K[F]
R[OB] K[F]
R[OC] 0
=0 CALL J/COMRLG
RC[OE] D
ALU_RLOG,Q,ALU,RC[OD],ALU ; READ THE RESULT
ALU_Q-D,CLR,UBCC ; RESULT CORRECT?
Z?
=0 ERROR1 ; RLOG STACK LOCATION NOT CORRECT
RLOGB: ALU/A+B.RLOG,LAB_R[0],K[ZERO],AMX/RMX ; WRITE THE LOCATION
; BEING TESTED WITH RA[0], K[ZERO] AND ALU/A+B
; COMPUTE THE EXPECTED RESULT
R[OA] 0
R[OB] 0
ALU_Q=K[1],R[OC],ALU
=0 CALL J/COMRLG
RC[OE] D
ALU_RLOG,Q,ALU,RC[OD],ALU ; READ THE RESULT
ALU_Q-D,CLR,UBCC ; WAS THE RESULT CORRECT?
Z?
=0 ERROR1 ; RLOG STACK LOCATION INCORRECT
; THIS LOOP WRITES THE LOCATION BEING TESTED WITH
RA[0]
KMX<3:0>=COUNT PATTERN
ALU/A-B
R[6] K[F] ; INITIALIZE A COUNTER
R[7] K[ZERO] ; AND THE KMX DATA PATTERN
R[OB] 0
R[OC] 0
RLOGC: SC R[7]
R[OA] LA
ALU/A-B.RLOG,LAB_R[0],K[SC],AMX/RMX ; TEST INSTRUCTION, WRITE THE RLOG
=0 CALL J/COMRLG ; GO COMPUTE THE EXPECTED RESULT
RC[OE] D
ALU_RLOG,Q,ALU,RC[OD],ALU ; READ THE ACTUAL RESULT
ALU_Q-D,CLR,UBCC ; WAS IT CORRECT?
Z?
=0 ERROR1 ; RLOG STACK LOCATION INCORRECT.
LAB_R[7] ; INCREMENT KMX DATA PATTERN
R[7] LA+K[1]
ALU_R[6],CLR,UBCC ; TRIED ALL PATTERNS?

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U 12FA,	0000,013C,0180,0800,0000,1186	:2892
U 1186,	0018,0000,0580,0AB0,0000,12F2	:2893
U 1187,	0000,003C,0180,0800,0000,12FB	:2894
		:2895
		:2896
		:2897
		:2898
U 12FB,	0018,0038,6180,0AB0,0000,12FC	:2899
U 12FC,	0018,0038,1980,0AB8,0000,12FD	:2900
U 12FD,	0003,003C,0180,0AD0,0000,12FE	:2901
U 12FE,	0003,003C,0180,0AE0,0000,12FF	:2902
U 12FF,	0000,003C,0180,0A38,0082,1300	:2903
U 1300,	0000,003C,0180,0AD8,0000,1301	:2904
U 1301,	0001,0004,1980,0868,0000,1188	:2905
U 1188,	0000,003D,0180,0800,0000,11A4	:2906
U 1189,	0001,003C,0180,09F0,0000,1302	:2907
U 1302,	0000,0038,01C0,09E8,1C00,1303	:2908
U 1303,	001D,2000,0180,0800,0010,1304	:2909
U 1304,	0000,013C,0180,0800,0000,118A	:2910
U 118A,	0000,003D,0180,0800,0000,1109	:2911
U 118B,	0000,003C,0180,0A38,0000,1305	:2912
U 1305,	0018,0014,0580,0AB8,0000,1306	:2913
U 1306,	0000,003C,0180,0A30,0010,1307	:2914
U 1307,	0000,013C,0180,0800,0000,118C	:2915
U 118C,	0018,0000,0580,0AB0,0000,12FF	:2916
U 118D,	0000,003C,0180,0800,0000,1308	:2917
		:2918
		:2919
		:2920
		:2921
U 1308,	0018,0038,6180,0AB0,0000,1309	:2922
U 1309,	0018,0038,1980,0AB8,0000,130A	:2923
U 130A,	0018,0038,6180,0AD8,0000,130B	:2924
U 130B,	001B,0000,0580,0AE0,0000,130C	:2925
U 130C,	0000,003C,0180,0A38,0082,130D	:2926
U 130D,	0000,003C,0180,0AD0,0000,130E	:2927
U 130E,	0001,0018,1D80,0A78,0000,118E	:2928
U 118E,	0000,003D,0180,0800,0000,11A4	:2929
U 118F,	0001,003C,0180,09F0,0000,130F	:2930
U 130F,	0000,0038,01C0,09E8,1C00,1310	:2931
U 1310,	001D,2000,0180,0800,0010,1311	:2932
U 1311,	0000,013C,0180,0800,0000,1190	:2933
U 1190,	0000,003D,0180,0800,0000,1109	:2934
U 1191,	0000,003C,0180,0A38,0000,1312	:2935
U 1312,	0018,0014,0580,0AB8,0000,1313	:2936
U 1313,	0000,003C,0180,0A30,0010,1314	:2937
U 1314,	0000,013C,0180,0800,0000,1192	:2938
U 1192,	0018,0000,0580,0AB0,0000,130C	:2939
U 1193,	0000,003C,0180,0800,0000,1315	:2940
		:2941
		:2942
		:2943
		:2944
U 1315,	0018,0038,6180,0AB0,0000,1316	:2945
U 1316,	0018,0038,1980,0AB8,0000,1317	:2946

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U 1317, 0018,0038,6180,0AD0,0000,1318 :2947
U 1318, 0018,0000,0580,0AE0,0000,1319 :2948
U 1319, 0000,003C,0180,0A38,0082,131A :2949
U 131A, 0000,003C,0180,0AD8,0000,131B :2950
U 131B, 0001,0018,6180,0868,0000,1194 :2951
U 1194, 0000,003D,0180,0800,0000,11A4 :2952
U 1195, 0001,003C,0180,09F0,0000,131C :2953
U 131C, 0000,0038,01C0,09E8,1C00,131D :2954
U 131D, 001D,2000,0180,0800,0010,131E :2955
U 131E, 0000,013C,0180,0800,0000,1196 :2956
U 1196, 0000,003D,0180,0800,0000,1109 :2957
U 1197, 0000,003C,0180,0A38,0000,131F :2958
U 131F, 0018,0014,0580,0AB8,0000,1320 :2959
U 1320, 0000,003C,0180,0A30,0010,1321 :2960
U 1321, 0000,013C,0180,0800,0000,1198 :2961
U 1198, 0018,0000,0580,0AB0,0000,1319 :2962
:2963
U 1199, 0001,0018,6180,0A78,0000,1322 :2964
U 1322, 0000,0038,0180,0800,1C00,1323 :2965
U 1323, 0000,003C,0180,0A18,0010,1324 :2966
U 1324, 0000,013C,0180,0800,0000,119A :2967
U 119A, 0018,0000,0580,0AA0,0000,1325 :2968
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U 119B, 0000,003C,0180,0800,0000,11A1 :2975
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:2977
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U 1325, 0000,003C,0180,0A20,0000,1326 :2983
U 1326, 0000,003C,0180,0AD0,0000,1327 :2984
U 1327, 0000,003C,0180,09E0,0000,1328 :2985
U 1328, 0003,003C,0180,0AD8,0000,1329 :2986
U 1329, 0003,003C,0180,0AE0,0000,119C :2987
U 119C, 0000,003D,0180,0800,0000,11A4 :2988
U 119D, 0001,003C,0180,09F0,0000,132A :2989
U 132A, 0000,0038,01C0,09E8,1C00,132B :2990
U 132B, 001D,2000,0180,0800,0010,132C :2991
U 132C, 0000,013C,0180,0800,0000,119E :2992
U 119E, 0000,003D,0180,0800,0000,1109 :2993
:2994
:2995
:2996
U 119F, 0000,003C,0180,0A20,0010,132D :2997
U 132D, 0000,013C,0180,0800,0000,11A0 :2998
U 11A0, 0018,0000,0580,0AA0,0000,1325 :2999
U 11A1, 0000,003C,0180,0A18,0000,132E :3000
U 132E, 0018,0014,0580,0A98,0000,132F :3001

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RLOGF: R[0A]_K[F]
ALU_0=K[.1],R[0C]_ALU
SC R[7]
R[0B]_LA
ALU/A+B.RLOG,LAB_R(SC),K[F],AMX/RAMX ; WRITE THE RLOG
=0 CALL,J/COMRLG ; GO COMPUTE THE EXPECTED RESULT
R[0E]_D
ALU_RLOG,Q ALU,R[0D]_ALU ; GET THE ACTUAL RESULT
ALU_Q-D,CLK.UBCC ; WAS THE RESULT CORRECT?
Z?
=0 ERROR1 ; RLOG STACK LOCATION INCORRECT.
LAB_R[7] ; INCREMENT THE RA ADDRESS
R[7]_LA+K[.1]
ALU_R[6],CLK.UBCC ; TRIED ALL ADDRESSES?
Z?
=0 R[6]_LA-K[.1],J/RLOGF ; IF NOT CONTINUE
; WRITE THE LOCATION JUST TESTED WITH: RA[0F], K[F] AND ALU/A+B
LAB_R[0F],ALU/A+B.RLOG,K[F],AMX/RAMX
ALU_RLOG ; READ THIS OFF THE STACK
ALU_R[3],CLK.UBCC ; WAS THE LOCATION JUST TESTED LOCATION 0?
Z?
=0 R[4]_LA-K[.1],J/RLOG3 ; IF IT WAS NOT LOCATION 0
; GO READ ALL THE OTHER LOCATION
; BELOW THE LOCATION JUST TESTED
; BY DECREMENTING THE STACK POINTER
; AND CHECKING THE KMX FIELD
; FOR THE COUNT PATTERN ORIGINALLY
; WRITTEN INTO THEM
; IF LOCATION 0 WAS JUST TESTED
; GO TEST LOCATION 1
J/RLOG35
; THIS LOOP DECREMENTS THE RLOG STACK POINTER AND
; READS ALL THE LOCATIONS BELOW THE LOCATION JUST TESTED WHICH WERE
; WRITTEN WITH :
RA[0]
K<3:0>=COUNT PATTERN=RLOG STACK POINTER VALUE OF THIS LOCATION
ALU/A-B
RLOG3: LAB_R[4] ; GO COMPUTE THE EXPECTED
R[0A]_LA ; CONTENTS OF THIS LOCATION
R[0C]_LA
R[0B]_0
R[0C]_0
=0 CALL,J/COMRLG
R[0E]_D
ALU_RLOG,Q ALU,R[0D]_ALU ; READ THE RLOG STACK
ALU_Q-D,CLK.UBCC ; IS THIS LOCATION CORRECT?
Z?
=0 ERROR1 ; RLOG STACK LOCATION INCORRECT. NOTE
; THAT THIS ERROR INDICATES
; AN ADDRESSING (NOT DATA) ERROR
; IN THE RLOG STACK
; TESTED ALL LOCATIONS?
ALU_R[4],CLK.UBCC
Z?
=0 R[4]_LA-K[.1],J/RLOG3 ; IF NOT CONTINUE.
RLOG35: LAB_R[3] ; INCREMENT THE POINTER TO THE
R[3]_LA+K[.1] ; RLOG STACK LOCATION CURRENTLY BEING TESTED

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U 132F, 0000,003C,0180,0A10,0010,1330 :3002
U 1330, 0000,013C,0180,0800,0000,11A2 :3003
U 11A2, 0018,0000,0580,0A90,0000,116E :3004
U 11A3, 0000,003C,0180,0800,0000,1336 :3005
                                     :3006
                                     :3007
                                     :3008
                                     :3009
                                     :3010
                                     :3011
                                     :3012
                                     :3013
                                     :3014
                                     :3015
                                     :3016
U 11A4, 0800,003D,0180,0A50,0000,1010 :3017
U 11A5, 0000,003C,01C0,0A58,0000,1331 :3018
U 1331, 081D,2030,0180,0800,0000,11A6 :3019
U 11A6, 0100,003D,0180,0800,0000,1010 :3020
U 11A7, 0100,003C,0180,0800,0000,1332 :3021
U 1332, 0000,003C,6580,0800,0084,7333 :3022
U 1333, 0000,003C,0180,0A60,0010,1334 :3023
U 1334, 0000,013C,0180,0800,0000,11A8 :3024
U 11A8, 0801,001C,0180,0800,0000,11A9 :3025
U 11A9, 0000,003C,0180,0A68,0000,1335 :3026
U 1335, 081C,2032,0180,0AF0,0000,0001 :3027
U 1336, 0000,003C,0180,0800,0000,11AA :3028

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ALU_R[2],CLK.UBCC      ; ALL LOCATIONS TESTED?
Z?
=0 R[2] LA-K[.1],J/RLOG1 ; IF NOT CONTINUE
J/RLOG4
; THIS SUBROUTINE IS USED TO COMPUTE THE EXPECTED RLOG
; DATA. BEFORE CALLING THE RA SCRATCH PADS MUST
; BE IN THE STATE:
;
; R[0A] = KMX
; R[0B] = RA ADDRESS
; R[0C] = -1/0 = ADD/SUB
;
; THE RESULT IS LEFT IN D AND R[0E]
=0
COMRLG: D_R[0A],CALL,J/DC0
Q_R[0B]
ALU_Q[OR]D,D_ALU
=0 D_D.LEFT2,S17ZERO,CALL,J/DC0
D_D.LEFT2,S1/ZERO
SC_K[.10]
ALU_R[0C],CLK.UBCC
Z?
=0 ALU_D.ORNOT.MASK,D_ALU
LAB_R[0D]
ALU_LA[OR]D,D_ALU,R[0E]_ALU,RETURN1
RLOG4: NOP

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U 11AA. 0000,003D,0180,0800,0000,108E
U 11AB. 0018,0038,0980,09F8,0000,1337
U 1337. 0018,0038,6180,0AA0,0000,1338
U 1338. 0000,003C,D980,0800,0084,7339
U 1339. 0003,001C,0180,0AA8,0000,11AC
U 11AC. 0000,003D,0180,0800,0000,10FE
U 11AD. 0000,003C,0180,0A20,0082,133A
U 133A. 0800,003C,0180,0A28,0000,133B
U 133B. 0801,0024,0180,0800,0000,133C
U 133C. 0003,001C,0180,09F0,0082,133D
U 133D. 0001,003C,0180,0800,0010,133E
U 133E. 0000,013C,0180,0800,0000,11AE
U 11AE. 0000,003C,0180,0800,0000,1340
U 11AF. 0000,003C,0180,0800,0110,133F
U 133F. 0003,123C,0180,09E8,0000,10C7
U 10C7. 0000,003C,0180,0800,0000,10DF
U 10CF. 0000,003D,0180,0800,0000,1109
U 1340. 0000,003C,0180,0800,0110,1341
U 1341. 0018,1238,0580,09E8,0000,10D7
U 10D7. 0000,003D,0180,0800,0000,1109
U 10DF. 0000,003C,0180,0A20,0010,1342
U 1342. 0000,013C,0180,0800,0000,11B0
U 11B0. 0018,0000,0580,0AA0,0000,11AD
U 11B1. 0000,003C,0180,0800,0000,11B2

```

```

.PAGE 'TEST 8C BEN EALU.N TEST'
*****
++
TEST 8C BEN EALU.N TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 12 BIT WHICH IS DETERMINED BY
THE EALU N BIT (EALU BIT <09> AS STORED IN THE UCC).
ERROR DESCRIPTION
DATA AT EALU OUTPUT WHEN THE UBCC ARE CLOCKED
ERROR CODE:
0=> BEN FAILED TO BE DEASSERTED
1=> BEN FAILED TO BE ASSERTED
--
*****
=0
EALUN1: NEWTST
RC[0F],K[.2]
RC[4],K[.F] : SET UP A COUNTER
SC,K[.9] : GENERATE A MASK
ALD NOT.MASK,R[5]_ALU : R[5]=200 (HEX)
=0
EALUN2: SC,R[4] : GENERATE TEST DATA
D,R[5] : CALCULATE THE RESULT
ALU_D.ANDNOT.MASK,D_ALU
ALU_NOT.MASK,SC_ALU,RC[0E]_ALU : LOAD TEST DATA INTO SC
ALU_D,CLK.UBCC
Z?
=0
J/EALUN3
FE_SC,CLK.UBCC : CLOCK THE UBCC
EALU.N?,RC[0D]_0 : BRANCH BIT=EALU.N=0
=0111
J/EALUN4
ERROR1 : BRANCH ASSERTED!
EALUN3: FE_SC,CLK.UBCC : TEST INSTRUCTION. CLOCK THE UBCC
EALU.N?,RC[0D]_K[.1] : BRANCH BIT=EALU.N=1
=0111
ERROR1 : BRANCH NOT ASSERTED!
EALUN4: ALU_R[4],CLK.UBCC : DONE TESTING?
Z?
=0
R[4]_LA-K[.1],J/EALUN2 : IF NOT DECREMENT COUNTER AND CONTINUE
NOP

```



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:3071
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:3100
:3101
:3102
:3103
:3104
:3105
:3106
:3107
:3108
:3109
:3110
:3111
U 11B2, 0000,003D,0180,0800,0000,108E
U 11B3, 0018,0038,0980,09F8,0000,1343
U 1343, 0018,0038,6180,0AA0,0000,1344
U 1344, 0018,0038,8180,0AA8,0000,11B4
U 11B4, 0000,003D,0180,0800,0000,10FE
U 11B5, 0000,003C,0180,0A20,0082,1345
U 1345, 0800,003C,0180,0A28,0000,1346
U 1346, 0801,0024,0180,09F0,0082,1347
U 1347, 0001,003C,0180,0800,0010,1348
U 1348, 0000,013C,0180,0800,0000,11B6
U 11B6, 0000,003C,0180,0800,0000,134A
U 11B7, 0000,003C,0180,0800,0110,1349
U 1349, 0003,123C,0180,09E8,0000,108B
U 108B, 0000,003D,0180,0800,0000,1109
U 108F, 0000,003C,0180,0800,0000,134C
U 134A, 0000,003C,0180,0800,0110,134B
U 134B, 0000,123C,0180,0800,0000,10AB
U 10AB, 0000,003C,0180,0800,0000,134C
U 10AF, 0018,0039,0580,09E8,0000,1109
U 134C, 0000,003C,0180,0A20,0010,134D
U 134D, 0000,013C,0180,0800,0000,11B8
U 11B8, 0018,0000,0580,0AA0,0000,11B5
U 11B9, 0000,003C,0180,0800,0000,11BA

```

```

.PAGE 'TEST 8D BEN EALU.Z TEST'
*****
++
TEST 8D BEN EALU.Z TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 12 BIT WHICH IS DETERMINED BY
THE EALU Z BIT (EALU=0 AS STORED IN THE UCC).
ERROR DESCRIPTION
DATA PATTERN USED TO SET THE EALU UBCC
ERROR CODE:
0=> BEN FAILED TO BE ASSERTED
1=> BEN FAILED TO BE DEASSERTED
--
*****
=0
EALUZ1: NEWTST
RC[0F]_K[.2]
R[4]_K[.F] ; SET UP A COUNTER
R[5]_K[.3FF] ; GET A MASK.
=0
ERLOOP
EALUZ2: SC_R[4] ; GENERATE THE TEST DATA.
D_R[5] ; SEE IF BRANCH WILL BE ASSERTED OR NOT.
ALU_D.ANDNOT.MASK,SC_ALU,RC[0E]_ALU,D_ALU
ALU_D,CLK.UBCC
Z?
=0
J/EALUZ3
FE_SC,CLK.UBCC ; TEST INSTRUCTION, LOAD THE UBCC
EALU.Z?,RC[0D]_0 ; BRANCH BIT=EALU.Z=1
=1011 ERROR1 ; BRANCH FAILED, NOT ASSERTED.
J/EALUZ4
EALUZ3: FE_SC,CLK.UBCC ; TEST INSTRUCTION, LOAD UBCC
EALU.Z? ; BRANCH BIT=EALU.Z=0
=1011 J/EALUZ4
ERROR1,RC[0D]_K[.1] ; FAILED, BRANCH ASSERTED!
EALUZ4: ALU_R[4],CLK.UBCC ; IF COUNTER IS NOT 0
Z? ; DECREMENT AND CONTINUE TEST
=0 R[4]_LA-K[.1],J/EALUZ2
NOP

```

```

.PAGE      'TEST 8E      BEN ALU<01:00> TEST'
*****
++
TEST 8E      BEN ALU<01:00> TEST

TEST DESCRIPTION
THIS IS A TEST OF THE BEN 15 BITS WHICH ARE DEPENDENT
UPON THE ALU OUTPUT OF THE PREVIOUS CYCLE IN BIT POSITIONS
ALU<01:00>.

ERROR DESCRIPTION
LOW ORDER THREE BITS OF WHERE THE BRACH ACTUALLY WENT
LOW ORDER THREE BITS OF WHERE THE BRANCH WAS EXPECTED TO GO
--
*****
=0
ALU01B: NEWTST
      RC[0F]_K[.2]
      //////////////////////////////////////
+
      SUBTEST 1
            ALU <01:00> =00
-
=0      SUBTEST
NOP
=0      ERLOOP
NOP
      D_K[.4]
      Q_K[.3]
      ACU 0(K)
=00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.4]      : ALU<01:00>=00
      ERROR1,RC[0E]_Q
      NOP
=
      //////////////////////////////////////
+
      SUBTEST 2
            ALU <01:00>=01
-
=0      SUBTEST
NOP
=0      ERLOOP
NOP
      D_K[.1]
      Q_K[.6]
      ACU_K[.1]
=00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.1]      : ALU<01:00>=01
      ERROR1,RC[0E]_Q
      NOP
=
      //////////////////////////////////////
+
      SUBTEST 3
            ALU <01:00>=10

```

```
U 11C4. 0000,003D,0180,0800,0000,111E :3167
U 11C5. 0000,003C,0180,0800,0000,11C6 :3168
U 11C6. 0000,003D,0180,0800,0000,10FE :3169
U 11C7. 0018,0038,05C0,0800,0000,1354 :3170
U 1354. 0019,2000,05C0,0800,0000,1355 :3171
U 1355. 0818,0038,0980,0800,0000,1356 :3172
U 1356. 0018,0038,0980,0800,0000,1048 :3173
U 1048. 0018,1539,0980,09E8,0000,1028 :3174
U 1049. 0001,203D,0180,09F0,0000,1109 :3175
U 104A. 0000,003C,0180,0800,0000,11C8 :3176
                                     :3177
                                     :3178
                                     :3179
                                     :3180
                                     :3181
                                     :3182
U 11C8. 0000,003D,0180,0800,0000,111E :3183
U 11C9. 0000,003C,0180,0800,0000,11CA :3184
U 11CA. 0000,003D,0180,0800,0000,10FE :3185
U 11CB. 0818,0038,0D80,0800,0000,1357 :3186
U 1357. 0819,0014,0580,0800,0000,1358 :3187
U 1358. 0018,0038,11C0,0800,0000,1359 :3188
U 1359. 0018,0038,0D80,0800,0000,1050 :3189
U 1050. 0018,1539,0D80,09E8,0000,1028 :3190
U 1051. 0001,203D,0180,09F0,0000,1109 :3191
U 1052. 0000,003C,0180,0800,0000,11CC :3192
                                     :3193
                                     :3194
```

```
:-
=0 SUBTEST
NOP
=0 ERLOOP
O_K[.6]
O_Q-K[.1]
D_K[.2]
A[U_K[.2]
=00 BEN7ALU1=0,CALL,J/BRT1,RC[0D]_K[.2] ; ALU<01:00>=10
ERROR1,RC[0E]_Q
NOP
=
:////////////////////////
:++
SUBTEST 4
ALU <01:00>=11
:-
=0 SUBTEST
NOP
=0 ERLOOP
D_K[.3]
A[U_D+K[.1],D_ALU
Q_K[.4]
A[U_K[.3]
=00 BEN7ALU1=0,CALL,J/BRT1,RC[0D]_K[.3] ; ALU<01:00>=11
ERROR1,RC[0E]_Q
NOP
=
```

```

:3195 .PAGE "TEST 8F ILLEGAL FLOATING OPERAND UTRAP TEST"
:3196 *****
:3197 ++
:3198 TEST 8F ILLEGAL FLOATING OPERAND TEST
:3199
:3200 TEST DESCRIPTION
:3201 THIS IS A TEST OF THE ILLEGAL FLOATING OPERAND DETECTION
:3202 AND UTRAP LOGIC.
:3203
:3204 ERROR DESCRIPTION
:3205 DATA USED
:3206
:3207 --
:3208 *****
:3209 =0
U 11CC, 0000,003D,0180,0800,0000,108E :3210 ILFLOP: NEWTST
U 11CD, 0000,003C,6180,0800,0084,735A :3211 SC K[F] ; GENERATE SOME CONSTANTS
U 135A, 0003,001C,0180,09F0,0000,135B :3212 ALU_NOT.MASK,RC[OE]_ALU
U 135B, 0003,001C,0180,0A98,0000,135C :3213 ALU_NOT.MASK,RC[3]_ALU ; RC[3]=00008C00
U 135C, 0000,003C,D980,0800,0084,735D :3214 SC R[9]
U 135D, 0003,001C,0180,0A90,0000,135E :3215 ALU_NOT.MASK,RC[2]_ALU ; RC[2]=200
U 135E, 0018,0038,0580,09F8,0000,11CE :3216 RC[OF]_K[1]
:3217 //////////////////////////////////////
:3218 +
:3219 SUBTEST 1
:3220 FLOATING OPERAND SHOULD TRAP
:3221
:3222 =0 SUBTEST
:3223 NOP
:3224 =0 ERLOOP
:3225 LAB R[2]
:3226 RC[OF]_LA ; SET UTRAP FLAG FOR ILLEGAL FLOATING OPERAND
:3227 ALU_R[3],MSC/CHK.FLT.OPR ; SHOULD TRAP HERE WITH ALU=00008000.
:3228 ALU_RC[OF],CLK.UBCC ; DID A UTRAP OCCUR?
:3229 Z?
:3230 =0 ERROR1 ; NO UTRAP WITH ALU=00008000
:3231 NOP
:3232 //////////////////////////////////////
:3233 +
:3234 SUBTEST 2
:3235 ALU = 0, NO UTRAP SHOULD OCCUR
:3236
:3237 =0 SUBTEST
:3238 NOP
:3239 =0 ERLOOP
:3240 LAB R[2]
:3241 RC[OF]_LA ; SET THE ILLEGAL FLOATING OPERAND UTRAP FLAG
:3242 ALU_0(K),RC[OE]_ALU,MSC/CHK.FLT.OPR ; SHOULD NOT TRAP WITH ALU=0
:3243 ALU_RC[OF],CLK.UBCC ; DID A UTRAP OCCUR
:3244 Z?
:3245 =0 J/FLOP2
:3246 ERROR1 ; AN ILLEGAL FLOATING OPERAND UTRAP
:3247 OCCURRED WITH ALU=0
:3248 //////////////////////////////////////
:3249 +

```

U 11CC, 0000,003D,0180,0800,0000,108E
 U 11CD, 0000,003C,6180,0800,0084,735A
 U 135A, 0003,001C,0180,09F0,0000,135B
 U 135B, 0003,001C,0180,0A98,0000,135C
 U 135C, 0000,003C,D980,0800,0084,735D
 U 135D, 0003,001C,0180,0A90,0000,135E
 U 135E, 0018,0038,0580,09F8,0000,11CE

U 11CE, 0000,003D,0180,0800,0000,111E
 U 11CF, 0000,003C,0180,0800,0000,11D0
 U 11D0, 0000,003D,0180,0800,0000,10FE
 U 11D1, 0000,003C,0180,0A10,0000,135F
 U 135F, 0000,003C,0180,0AF8,0000,1360
 U 1360, 0000,003C,0180,0A18,0800,1361
 U 1361, 0000,003C,0180,0A78,0010,1362
 U 1362, 0000,013C,0180,0800,0000,11D2
 U 11D2, 0000,003D,0180,0800,0000,1109
 U 11D3, 0000,003C,0180,0800,0000,11D4

U 11D4, 0000,003D,0180,0800,0000,111E
 U 11D5, 0000,003C,0180,0800,0000,11D6
 U 11D6, 0000,003D,0180,0800,0000,10FE
 U 11D7, 0000,003C,0180,0A10,0000,1363
 U 1363, 0000,003C,0180,0AF8,0000,1364
 U 1364, 0018,0038,1980,09F0,0800,1365
 U 1365, 0000,003C,0180,0A78,0010,1366
 U 1366, 0000,013C,0180,0800,0000,11D8
 U 11D8, 0000,003C,0180,0800,0000,1367
 U 11D9, 0000,003D,0180,0800,0000,1109


```

:3250      SUBTEST 3
:3251      ; NOW PERFORM TEST WITH ALU DATA EQUAL TO A PATTERN OF A 1 FLOATING
:3252      ; ACROSS ALU<14:07> AND ALU<15>=1. THIS IS A CONDITION WHICH
:3253      ; SHOULD NOT UTRAP.
:3254      ;
:3255      =0      SUBTEST
:3256      NOP
:3257      FLOP2:  RC[0F],K[.1]
:3258      RE[1],K[.7]      ; INITIALIZE A COUNTER USED TO
:3259      ; GENERATE THE TEST DATA.
:3260      =0      ERLOOP
:3261      FLOP3:  Q_R[1]      ; GENERATE THE TEST DATA.
:3262      D_K[.7]
:3263      ALU_Q[A+B]D,SC_ALU
:3264      D_R[3]
:3265      ALU_D.ANDNOT.MASK,RC[0E],ALU,D_ALU
:3266      LAB_R[2]
:3267      RC[0F],LA      ; SET THE ILLEGAL FLOATING OPERAND UTRAP FLAG.
:3268      ALU_D,MSC/CHK.FLT.OPR      ; SHOULD NOT TRAP
:3269      ALU_R[0F],CLK.UBCC      ; SEE IF A UTRAP OCCURRED.
:3270      Z?
:3271      =0      J/FLOP4
:3272      ERROR1      ; AN ILLEGAL FLOATING OPERAND
:3273      ; UTRAP OCCURRED WITH THE ALU
:3274      ; OUTPUT NOT EQUAL TO AN ILLEGAL
:3275      ; FLOATING OPERAND.
:3276      FLOP4:  ALU_R[1],CLK.UBCC      ; TRIED ALL TEST DATA PATTERNS?
:3277      Z?
:3278      =0      R[1],LA-K[.1],J/FLOP3      ; IF NOT CONTINUE
:3279      NOP
:3280      =0
:3281      DUMMY1: NEWTST

```

U 11DA, 0000,003D,0180,0800,0000,111E
U 11DB, 0000,003C,0180,0800,0000,1367
U 1367, 0018,0038,0580,09F8,0000,1368
U 1368, 0018,0038,5D80,0A88,0000,11DC

U 11DC, 0000,003D,0180,0800,0000,10FE
U 11DD, 0000,003C,01C0,0A08,0000,1369
U 1369, 0818,0038,5D80,0800,0000,136A
U 136A, 001D,2014,0180,0800,0082,136B
U 136B, 0800,003C,0180,0A18,0000,136C
U 136C, 0801,0024,0180,09F0,0000,136D
U 136D, 0000,003C,0180,0A10,0000,136E
U 136E, 0000,003C,0180,0AF8,0000,136F
U 136F, 0001,003C,0180,0800,0800,1370
U 1370, 0000,003C,0180,0A78,0010,1371
U 1371, 0000,013C,0180,0800,0000,11DE
U 11DE, 0000,003C,0180,0800,0000,1372
U 11DF, 0000,003D,0180,0800,0000,1109

U 1372, 0000,003C,0180,0A08,0010,1373
U 1373, 0000,013C,0180,0800,0000,11E0
U 11E0, 0018,0000,0580,0A88,0000,11DD
U 11E1, 0000,003C,0180,0800,0000,11E2

U 11E2, 0000,003D,0180,0800,0000,108E

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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	1862=	1863=	1839	2738=
U 1008	3143=	3144=	3145=	1840	2000=	2001=	1841	2740=
U 1010	1952=	1953=	1954=	1955=	1956=	1957=	1958=	1959=
U 1018	1960=	1961=	1962=	1963=	1964=	1965=	1966=	1967=
U 1020	1983=	1984=	1985=	1986=	1987=	1988=	1989=	1990=
U 1028	1991=	1992=	1993=	1994=	1995=	1996=	1997=	1998=
U 1030	2064=	2065=	2066=	2067=	2068=	2069=	2070=	2071=
U 1038	2072=	2073=	2074=	2075=	2076=	2077=	2078=	2079=
U 1040	3159=	3160=	3161=	1842	2024=	2025=	1843	2748=
U 1048	3175=	3176=	3177=	1844	2032=	2033=	1902:	2749=
U 1050	3191=	3192=	3193=	1864	2038=	2039=	1865	2757=
U 1058	2040=	2041=	1905:	1866	2042=	2043=	1908:	2759=
U 1060	2143=	2144=	2145=	2146=	2147=	2148=	2149=	2150=
U 1068	2151=	2152=	2153=	2154=	2155=	2156=	2157=	2158=
U 1070	2213=	2214=	2215=	2216=	2217=	2218=	1867	2766=
U 1078	2049=	2050=	2052=	2053=	2056=	2057=	1868	2767=
U 1080	2273=	2274=	2275=	2276=	2277=	2278=	2279=	2280=
U 1088	2281=	1869	1870	3102=	2059=	2060=	1880	3103=
U 1090	2346=	2347=	2348=	2349=	2350=	1881	1882	2775=
U 1098	2103=	2104=	2111=	2112=	2117=	2118=	1883	2777=
U 10A0	2416=	2417=	2418=	2419=	2420=	2421=	2422=	2423=
U 10A8	2119=	2120=	1884	3106=	2122=	2123=	1885	3107=
U 10B0	2128=	2129=	2132=	2133=	2135=	2136=	1886	2780=
U 10B8	2138=	2139=	2186=	2187=	2189=	2190=	1887	2781=
U 10C0	2198=	2199=	2202=	2203=	2205=	2206=	1888	3062=
U 10C8	2208=	2209=	2249=	2250=	2251=	2252=	1889	3063=
U 10D0	2260=	2261=	2264=	2266=	2268=	2269=	1890	3066=
U 10D8	2310=	2311=	2312=	2313=	2319=	2320=	1891	3067=
U 10E0	2326=	2329=	1892	2195=	2331=	2334=	1893	2196=
U 10E8	2339=	2340=	1894	2257=	2381=	2382=	1895	2258=
U 10F0	2383=	2384=	1896	2316=	2390=	2391=	1897	2317=
U 10F8	2395=	2396=	1898	2335=	2401=	2404=	1899	2336=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1900	2409=	2410=	1834:	1835:	1836:	1837:
U 1110	2442=	2443=	1901	2387=	2445=	2446=	1903	2388=
U 1118	2454=	2455=	1904	2405=	2462=	2463=	1936	2406=
U 1120	2465=	2466=	2483=	2484=	2486=	2487=	2495=	2496=
U 1128	2503=	2504=	2506=	2507=	2524=	2525=	2527=	2528=
U 1130	2536=	2537=	2544=	2545=	2547=	2548=	2565=	2566=
U 1138	2568=	2569=	2577=	2578=	2585=	2586=	2588=	2589=
U 1140	2606=	2607=	2609=	2610=	2618=	2619=	2626=	2627=
U 1148	2629=	2630=	2646=	2647=	2649=	2650=	2658=	2659=
U 1150	2666=	2667=	2669=	2670=	1937	1928:	2687=	2688=
U 1158	2693=	2694=	2703=	2704=	2712=	2713=	2715=	2716=
U 1160	2733=	2734=	2741=	2742=	2753=	2754=	2760=	2761=
U 1168	2771=	2772=	2809=	2810=	2814=	2815=	2817=	2818=
U 1170	2819=	2820=	2821=	2822=	2834=	2835=	2841=	2842=
U 1178	2847=	2850=	2855=	2856=	2860=	2861=	2866=	2867=
U 1180	2871=	2876=	2883=	2884=	2888=	2889=	2893=	2894=
U 1188	2906=	2907=	2911=	2912=	2916=	2917=	2929=	2930=
U 1190	2934=	2935=	2939=	2940=	2952=	2953=	2957=	2958=
U 1198	2962=	2964=	2968=	2975=	2988=	2989=	2993=	2997=

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ESKAH25.MCR

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MICRO2

1M(01)

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SEQ 0322
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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2999=	3000=	3004=	3005=	3017=	3018=	3020=	3021=
U 11A8	3025=	3026=	3047=	3048=	3052=	3053=	3059=	3060=
U 11B0	3069=	3070=	3089=	3090=	3093=	3094=	3099=	3100=
U 11B8	3110=	3111=	3129=	3130=	3136=	3137=	3138=	3139=
U 11C0	3152=	3153=	3154=	3155=	3168=	3169=	3170=	3171=
U 11C8	3184=	3185=	3186=	3187=	3210=	3211=	3222=	3223=
U 11D0	3224=	3225=	3230=	3231=	3237=	3238=	3239=	3240=
U 11D8	3245=	3246=	3255=	3256=	3260=	3261=	3271=	3272=
U 11E0	3278=	3279=	3281=	1943	1944	1945	1947	1948
U 11E8	1949	1950	1968	1969	1970	1971	1972	1973
U 11F0	1974	1975	1976	1977	1999	2026	2027	2028
U 11F8	2029	2030	2031	2034	2035	2036	2037	2044
U 1200	2045	2046	2047	2048	2051	2054	2055	2058
U 1208	2061	2080	2105	2106	2107	2108	2109	2110
U 1210	2113	2114	2115	2116	2121	2124	2125	2126
U 1218	2127	2130	2131	2134	2137	2140	2159	2188
U 1220	2191	2192	2193	2194	2197	2200	2201	2204
U 1228	2207	2220	2253	2254	2255	2256	2259	2262
U 1230	2263	2267	2283	2314	2315	2318	2321	2322
U 1238	2323	2324	2325	2330	2337	2338	2352	2385
U 1240	2386	2389	2392	2393	2394	2397	2398	2399
U 1248	2400	2407	2408	2425	2444	2447	2448	2449
U 1250	2450	2451	2452	2453	2456	2457	2458	2459
U 1258	2460	2461	2464	2485	2488	2489	2490	2491
U 1260	2492	2493	2494	2497	2498	2499	2500	2501
U 1268	2502	2505	2526	2529	2530	2531	2532	2533
U 1270	2534	2535	2538	2539	2540	2541	2542	2543
U 1278	2546	2567	2570	2571	2572	2573	2574	2575
U 1280	2576	2579	2580	2581	2582	2583	2584	2587
U 1288	2608	2611	2612	2613	2614	2615	2616	2617
U 1290	2620	2621	2622	2623	2624	2625	2628	2648
U 1298	2651	2652	2653	2654	2655	2656	2657	2660
U 12A0	2661	2662	2663	2664	2665	2668	2689	2690
U 12A8	2691	2692	1929:	2695	2696	2697	2698	2699
U 12B0	2700	2701	2702	2705	2706	2707	2708	2709
U 12B8	2710	2711	2714	2735	2736	2737	2743	2744
U 12C0	2745	2746	2747	2751	2752	2755	2756	2762
U 12C8	2763	2764	2765	2769	2770	2773	2774	2778
U 12D0	2779	2811	2812	2813	2823	2824	2825	2826
U 12D8	2827	2828	2833	2836	2837	2838	2839	2840
U 12E0	2843	2844	2846	2852	2853	2854	2857	2858
U 12E8	2859	2863	2864	2865	2868	2869	2870	2877
U 12F0	2878	2879	2880	2881	2882	2885	2886	2887
U 12F8	2890	2891	2892	2899	2900	2901	2902	2903
U 1300	2904	2905	2908	2909	2910	2913	2914	2915
U 1308	2922	2923	2924	2925	2926	2927	2928	2931
U 1310	2932	2933	2936	2937	2938	2945	2946	2947
U 1318	2948	2949	2950	2951	2954	2955	2956	2959
U 1320	2960	2961	2965	2966	2967	2983	2984	2985
U 1328	2986	2987	2990	2991	2992	2998	3001	3002
U 1330	3003	3019	3022	3023	3024	3027	3028	3049
U 1338	3050	3051	3054	3055	3056	3057	3058	3061
U 1340	3064	3065	3068	3091	3092	3095	3096	3097

ZZ-ESKAH-V132
ESKAH25.MCR

Line Number Index

MICRO2

1M(01)

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SEQ 0323

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3098	3101	3104	3105	3108	3109	3140	3141
U 1350	3142	3156	3157	3158	3172	3173	3174	3188
U 1358	3189	3190	3212	3213	3214	3215	3216	3226
U 1360	3227	3228	3229	3241	3242	3243	3244	3257
U 1368	3258	3262	3263	3264	3265	3266	3267	3268
U 1370	3269	3270	3276	3277				
U 1378 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

ZZ-ESKAH-V132 Line Number Index F 10
ESKAH25.MCR MICRO2 1M(01) 16-DEC-82 11:01:45

SEQ 0324
Page 9

	Words not in bounds
ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH25	900

Used 900
Remaining

Total microwords used in memory U: 900
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH25.MIC

```
Pass 1 warnings: 0    Pass 2 warnings: 0
Pass 1 errors: 0    Pass 2 errors: 0
```

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2138	TEST 90 BEN STATE<03:00> TEST
: 2169	TEST 91 BEN STATE<07:04> TEST
: 2205	TEST 92 BEN SS (SIGN SOURCE) TEST
: 2231	TEST 93 BEN LA<01:00> TEST
: 2283	TEST 94 BEN D<01:00> (BEN/OC) TEST
: 2333	TEST 95 BEN/OF TEST 1
: 2398	TEST 96 BEN/OF TEST 2
: 2461	TEST 97 BEN PTE VALID TEST
: 2515	TEST 98 BEN PSL<27>, FPD, TEST
: 2556	TEST 99 BEN/1C TEST
: 2597	TEST 9A NESTED ERROR BIT, BEN/NEST.ERR AND CES<NEST.ERR> TEST
: 2670	TEST 9B BEN PSL.CC TEST
: 2717	TEST 9C BEN/1C, CONSOLE MODE, TEST
: 2752	TEST 9D BEN/1C, KERNAL MODE, TEST
: 2793	TEST 9E BRANCH ENABLE 3 -- ALU C BIT
: 2848	TEST 9F BRANCH ENABLE 1B -- ALU Z BIT
: 2897	TEST A0 ID BUS ADDRESSED BY THE SC

ZZ-ESKAH-V132
ESKAH26.MCR

Subroutines

MICRO2

7M(01)

16-DEC-82

11:03:36

I 10

SEQ 0327

Page

:1
:1804
:1805

.NOLIST
.LIST

LIST


```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
U 1100, 0000,003C,1980,0800,0084,7005
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,0580,0800,0084,7001
U 1106, 0000,003C,0980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7005
U 110D, 0000,003C,8980,0800,0084,7005
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7005
U 1001, 0000,003C,81F0,2C00,0000,102E
U 102E, 0C00,003C,01E0,0800,0000,103B
U 103B, 0000,003C,8180,3C00,0000,103E
U 103E, 0C00,003C,01E0,0800,0000,105B
U 105B, 0000,003C,01C0,0A78,0000,107C
U 107C, 0001,2024,0180,0800,0010,107E
U 107E, 0000,013C,0180,0800,0000,1004
U 1004, 0001,2036,0180,0AF8,0000,0000

```

```

:1825 TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1826 REGION/1000,13FF

```

```

:1827
:1828 FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1829 WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1830 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1831 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1832 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

```

```

:1833
:1834 FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1835 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1836 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1837 R[OF] AND DO A RETURN0.

```

```

:1838
:1839 IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1840 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1841 TO THE CONSOLE.

```

```

:1842
:1843 1100: SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
:1844 1101: SC_K[.1],J/TRPH0     ; DATA UNALIGNED
:1845 1102: SC_K[.2],J/TRPH0     ; X PAGE ERROR
:1846 1103: SC_K[.3],J/TRPH0     ; TB MODIFY
:1847 1104: SC_K[.4],J/TRPH0     ; TB PROT ERROR
:1848 1105: SC_K[.6],J/TRPH0     ; TB MISS
:1849 1106: SC_K[.9],J/TRPH0     ; RES FLOAT OPER
:1850 1107: SC_K[.7],J/TRPH0     ; TB PARITY
:1851 1108: SC_K[.8],J/TRPH0     ; CACHE PARITY
:1852 110C: SC_K[.C],J/TRPH1     ; RDS
:1853 110D: SC_K[.D],J/TRPH1     ; TIME OUT
:1854 110E: SC_K[.10],J/TRPH0    ; ODD ADDRESS
:1855 110F: SC_K[.F],J/TRPH1     ; CS PARITY
:1856 TRPH0: Q_ID[USTACK]
:1857          Q_D,D Q
:1858          ID[USTACK],D
:1859          Q_D,D Q
:1860          Q-R[OF]
:1861          ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
:1862          Z?                               ; BRANCH IF NO
:1863          =0 ALU_Q.AND.MASK,R[OF],ALU,RETURN0 ; CLEAR THE BIT AND RETURN

```

```

:1864
:1865 THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1866 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1867 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

```

:1868
:1869 DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1870 TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1871 FAULT STATUS REGISTER
:1872 SBI ERROR REGISTER
:1873 TIMEOUT ADDRESS REGISTER
:1874 MAINTENANCE REGISTER
:1875 CACHE PARITY REGISTER
:1876 TB ERROR REGISTER 1
:1877 TB ERROR REGISTER 0

```

U 1005, 0018,0038,1D80,09E8,0000,100C :1861
U 100C, 0000,003D,D980,0800,0084,7196 :1862
U 100D, 0000,003C,49F0,2C00,0000,109C :1863
U 109C, 0001,203C,4DF0,2DB0,0000,109E :1864
U 109E, 0001,203C,65F0,2DB8,0000,10B0 :1865
U 10B0, 0001,203C,6DF0,2DD8,0000,10B2 :1866
U 10B2, 0001,203C,75F0,2DE0,0000,10B4 :1867
U 10B4, 0001,203C,79F0,2DC8,0000,10B6 :1868
U 10B6, 0001,203C,69F0,2DC0,0000,10BC :1869
U 10BC, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,116E :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q ID[TBER0]
RC[6] Q,Q ID[TBER1]
RC[7] Q,Q ID[SBI.ERR]
RC[0B] Q,Q ID[FAULT]
RC[0C] Q,Q ID[MAINT]
RC[9] Q,Q ID[PARITY]
RC[8] Q,Q ID[TIME.ADDR]
RC[0A] Q,Q ID[USTACK]
1000: RC[0E] Q,ERROR1

:+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2

U 10BE, 0000,003C,65F8,0800,0084,70D0 :1880
U 10D0, 0818,0038,8D80,0800,0000,10D2 :1881
U 10D2, 0D00,003C,0180,0800,0000,10D4 :1882
U 10D4, 0000,003C,3D80,3C00,0000,10D6 :1883
U 10D6, 0818,0038,0580,0800,0000,10DA :1884
U 10DA, 0D00,003C,0180,0800,0000,10DE :1885
U 10DE, 0F00,003C,3180,3C00,0000,10F0 :1886
U 10F0, 0000,003C,5D80,3C00,0000,10F2 :1887
U 10F2, 0000,003C,3980,3C00,0000,10F4 :1888
U 10F4, 0000,003C,2980,3C00,0000,10F6 :1889
U 10F6, 0000,003C,4980,3C00,0000,10FA :1890
U 10FA, 0818,0038,C180,0800,0000,10FE :1891
U 10FE, 0000,003C,6580,3C00,0000,1109 :1892
U 1109, 0F00,003C,6D80,3C00,0000,111A :1893
U 111A, 0000,003C,6D80,3C00,0000,111E :1894
U 111E, 0000,003C,6580,3C00,0000,1146 :1895
U 1146, 0003,003C,0180,09F0,0000,114E :1896
U 114E, 0003,003C,0180,0AF8,0000,1154 :1897
U 1154, 0003,003C,0180,09E8,0000,105E :1898
U 1166, 0818,0038,0980,0800,0000,105E :1899
U 116E, 0810,0038,0180,0978,0000,1174 :1900
U 1174, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 1176, 0810,0038,0180,0978,0000,1186 :1903
U 1186, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905

SCOPE: SC K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D K[.1F] : ...
D-DAL.SC :
ID[PSL]_D : WRITE THE PSL
D K[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC :
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.TS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.TS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D K[.FFFF] :
ID[SBI.ERR]_D :
ID[FAULT]_D,D_0 :
ID[FAULT]_D :
ID[SBI.ERR]_D :
RC[0E]_0 :
RC[0F]_0 :
RC[0D]_0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D-RC[0F]
D-D.AND.K[.FF00]
104E: D-D.OR.K[.4],J/CALLCON
ERROR2: D-RC[0F]
D-D.AND.K[.FF00]
105A: D-D.OR.K[.6],J/CALLCON
105E:
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

:+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
:13F0: NOP
:13F1: NOP
:13F2: NOP
:13F3: NOP

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,118E :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 118E, 0810,0038,4D80,0978,0000,1194 :1936
U 1194, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 1196, 0010,0038,01C0,0978,0000,119A :1943
U 119A, 0019,2034,4DC0,0800,0000,119E :1944
U 119E, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
U 11AA, 0118,0038,1B80,0800,0000,11BE :1947
U 11AE, 0118,0038,0B80,0800,0000,11BE :1948
U 11B5, 0118,0038,0780,0800,0000,11BE :1949
U 11BA, 0118,0038,C380,0800,0000,11BE :1950
:1951
U 1060, 0018,0038,1980,0800,0000,11AA :1952
U 1061, 0018,0038,1980,0800,0000,11AE :1953
U 1062, 0018,0038,1980,0800,0000,11B5 :1954
U 1063, 0018,0038,1980,0800,0000,11BA :1955
U 1064, 0018,0038,0980,0800,0000,11AA :1956
U 1065, 0018,0038,0980,0800,0000,11AE :1957
U 1066, 0018,0038,0980,0800,0000,11B5 :1958
U 1067, 0018,0038,0980,0800,0000,11BA :1959
U 1068, 0018,0038,0580,0800,0000,11AA :1960
U 1069, 0018,0038,0580,0800,0000,11AE :1961
U 106A, 0018,0038,0580,0800,0000,11B5 :1962
U 106B, 0018,0038,0580,0800,0000,11BA :1963
U 106C, 0018,0038,C180,0800,0000,11AA :1964
U 106D, 0018,0038,C180,0800,0000,11AE :1965
U 106E, 0018,0038,C180,0800,0000,11B5 :1966
U 106F, 0018,0038,C180,0800,0000,11BA :1967
U 11BE, 0100,003E,0380,0800,0000,0001 :1968
U 11C2, 0018,0038,01C0,0800,0000,1010 :1969
:1970

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.

-
SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

-
SETRCF: Q_RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX

=0000
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D,D.LEFT2,SI/7,RETURN1
DC.6: Q_K[.8]
=0


```

U 1010. 0000.003D.0180.0800.0000.1066 :1971
U 1011. 0019.2000.05C0.0800.0010.11C6 :1972
U 11C6. 0000.013C.0180.0800.0000.1014 :1973
U 1014. 0000.003C.0180.0800.0000.1010 :1974
U 1015. 0000.003E.0180.0800.0000.0001 :1975
U 11CA. 0018.0038.0580.0800.0000.11CE :1976
U 11CE. 0118.0038.0780.0800.0000.1212 :1977
U 1212. 0118.0038.0780.0800.0000.1213 :1978
U 1213. 0118.0038.0780.0800.0000.1214 :1979
U 1214. 0118.0038.0780.0800.0000.1215 :1980
U 1215. 0118.0038.0780.0800.0000.1216 :1981
U 1216. 0118.0038.0780.0800.0000.1217 :1982
U 1217. 0118.0038.0780.0800.0000.1218 :1983
U 1218. 0100.003E.0380.0800.0000.0001 :1984
U 1219. 0018.0038.0980.0800.0000.121A :1985
U 121A. 0218.0038.0B80.0800.0000.121B :1986
U 121B. 0218.0038.0B80.0800.0000.121C :1987
U 121C. 0218.0038.0B80.0800.0000.121D :1988
U 121D. 0218.0038.0B80.0800.0000.121E :1989
U 121E. 0218.0038.0B80.0800.0000.121F :1990
U 121F. 0218.0038.0B80.0800.0000.1220 :1991
U 1220. 0218.0038.0B80.0800.0000.1221 :1992
U 1221. 0200.003E.0380.0800.0000.0001 :1993
U 1222. 0F00.003C.0180.0800.0000.1223 :1994
U 1223. 0B19.0000.0580.0800.0000.1060 :1995

U 1080. 0019.2000.05C0.0800.0000.1081 :2000
U 1081. 0019.2000.05C0.0800.0000.1082 :2001
U 1082. 0019.2000.05C0.0800.0000.1083 :2002
U 1083. 0019.2000.05C0.0800.0000.1084 :2003
U 1084. 0019.2000.05C0.0800.0000.1085 :2004
U 1085. 0019.2000.05C0.0800.0000.1086 :2005
U 1086. 0019.2000.05C0.0800.0000.1087 :2006
U 1087. 0019.2000.05C0.0800.0000.1088 :2007
U 1088. 0019.2000.05C0.0800.0000.1089 :2008
U 1089. 0019.2000.05C0.0800.0000.108A :2009
U 108A. 0019.2000.05C0.0800.0000.108B :2010
U 108B. 0019.2000.05C0.0800.0000.108C :2011
U 108C. 0019.2000.05C0.0800.0000.108D :2012
U 108D. 0019.2000.05C0.0800.0000.108E :2013
U 108E. 0019.2000.05C0.0800.0000.108F :2014
U 108F. 0001.203C.0180.0800.0010.1224 :2015
U 1224. 001D.2114.01C0.0800.0000.101C :2016
U 101C. 0000.003E.0180.0800.0000.0001 :2017
U 101D. 0000.003E.0180.0800.0000.0002 :2018

U 1020. 0000.003D.0180.0800.0000.1225 :2021
U 1021. 0000.003C.0180.0800.0000.1225 :2022
U 1225. 0000.003C.01A8.0800.0000.1226 :2023
U 1226. 0000.003C.01A8.0800.0000.1227 :2024
U 1227. 0000.003C.01A8.0800.0000.1228 :2025

```

```

DC.6A: CALL,J/DC6
        ALU_Q-K[.1],Q_ALU,CLK.UBCC
        Z?
=0      J/DC.6A
        RETURN1
DCAAAA: ALU_K[.1]
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        ALU_K[.1],D_D.LEFT2,SI/7
        D_D.LEFT2,SI/7,RETURN1
DRAAAA: ALU_K[.2]
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        ALU_K[.2],D_D.RIGHT2,SI/7
        D_D.RIGHT2,SI/7,RETURN1
DC.NF:  D=0
        D=D-K[.1],J/DCO
        ; THIS TABLE IS USED AS A TARGET TO TEST BRANCHES.
        ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
        ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
=0000
BRTBLE: Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
BRT1:   Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
BRT2:   Q-Q-K[.1]
        Q-Q-K[.1]
        Q-Q-K[.1]
        ALU_Q,CLK.UBCC
        Z?,ALU_Q+D,Q_ALU
=0      RETURN1
        RETURN2
; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
=0
SHQLFT16: CALL,J/SHQLFT8
        J/SHQLFT8
SHQLFT8:  Q-Q.LEFT,SI/3
SHQLFT7:  Q-Q.LEFT,SI/3
        Q-Q.LEFT,SI/3

```



```

U 1228, 0000,003C,01A8,0800,0000,1229 :2026
U 1229, 0000,003C,01A8,0800,0000,122A :2027
U 122A, 0000,003C,01A8,0800,0000,122B :2028
U 122B, 0000,003C,01A8,0800,0000,122C :2029
U 122C, 0000,003E,01A8,0800,0000,0001 :2030
:2031
:2032
U 1024, 0000,003D,0180,0800,0000,122D :2033
U 1025, 0000,003C,0180,0800,0000,122D :2034
U 122D, 0000,003C,03A8,0800,0000,122E :2035
U 122E, 0000,003C,03A8,0800,0000,122F :2036
U 122F, 0000,003C,03A8,0800,0000,1230 :2037
U 1230, 0000,003C,03A8,0800,0000,1231 :2038
U 1231, 0000,003C,03A8,0800,0000,1232 :2039
U 1232, 0000,003C,03A8,0800,0000,1233 :2040
U 1233, 0000,003C,03A8,0800,0000,1234 :2041
U 1234, 0000,003E,03A8,0800,0000,0001 :2042
:2043
:2044
U 10A0, 0001,203E,0180,0A80,0000,0001 :2045
U 10A1, 0001,203E,0180,0A88,0000,0001 :2046
U 10A2, 0001,203E,0180,0A90,0000,0001 :2047
U 10A3, 0001,203E,0180,0A98,0000,0001 :2048
U 10A4, 0001,203E,0180,0AA0,0000,0001 :2049
U 10A5, 0001,203E,0180,0AA8,0000,0001 :2050
U 10A6, 0001,203E,0180,0AB0,0000,0001 :2051
U 10A7, 0001,203E,0180,0AB8,0000,0001 :2052
U 10A8, 0001,203E,0180,0AC0,0000,0001 :2053
U 10A9, 0001,203E,0180,0AC8,0000,0001 :2054
U 10AA, 0001,203E,0180,0AD0,0000,0001 :2055
U 10AB, 0001,203E,0180,0AD8,0000,0001 :2056
U 10AC, 0001,203E,0180,0AE0,0000,0001 :2057
U 10AD, 0001,203E,0180,0AE8,0000,0001 :2058
U 10AE, 0001,203E,0180,0AF0,0000,0001 :2059
U 10AF, 0001,203E,0180,0AF8,0000,0001 :2060
:2061
:2062
U 10C0, 0001,203E,0180,0980,0000,0001 :2063
U 10C1, 0001,203E,0180,0988,0000,0001 :2064
U 10C2, 0001,203E,0180,0990,0000,0001 :2065
U 10C3, 0001,203E,0180,0998,0000,0001 :2066
U 10C4, 0001,203E,0180,09A0,0000,0001 :2067
U 10C5, 0001,203E,0180,09A8,0000,0001 :2068
U 10C6, 0001,203E,0180,09B0,0000,0001 :2069
U 10C7, 0001,203E,0180,09B8,0000,0001 :2070
U 10C8, 0001,203E,0180,09C0,0000,0001 :2071
U 10C9, 0001,203E,0180,09C8,0000,0001 :2072
U 10CA, 0001,203E,0180,09D0,0000,0001 :2073
U 10CB, 0001,203E,0180,09D8,0000,0001 :2074
U 10CC, 0001,203E,0180,09E0,0000,0001 :2075
U 10CD, 0001,203E,0180,09E8,0000,0001 :2076
U 10CE, 0001,203E,0180,09F0,0000,0001 :2077
U 10CF, 0001,203E,0180,09F8,0000,0001 :2078
:2079
:2080

```

```

Q-Q.LEFT,S1/3
Q-Q.LEFT,S1/3
Q-Q.LEFT,S1/3
Q-Q.LEFT,S1/3
Q-Q.LEFT,S1/3,RETURN1
: THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
=0
SHQL16: CALL,J/SHQL8
J/SHQL8
SHQL8: Q-Q.LEFT,S1/7
SHQL7: Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7
Q-Q.LEFT,S1/7,RETURN1
: THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
=0000
WRRARB: R[0] Q,RETURN1
R[1] Q,RETURN1
R[2] Q,RETURN1
R[3] Q,RETURN1
R[4] Q,RETURN1
R[5] Q,RETURN1
R[6] Q,RETURN1
R[7] Q,RETURN1
R[8] Q,RETURN1
R[9] Q,RETURN1
R[0A] Q,RETURN1
R[0B] Q,RETURN1
R[0C] Q,RETURN1
R[0D] Q,RETURN1
R[0E] Q,RETURN1
R[0F] Q,RETURN1
: THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
=0000
WRRRC: RC[0] Q,RETURN1
RC[1] Q,RETURN1
RC[2] Q,RETURN1
RC[3] Q,RETURN1
RC[4] Q,RETURN1
RC[5] Q,RETURN1
RC[6] Q,RETURN1
RC[7] Q,RETURN1
RC[8] Q,RETURN1
RC[9] Q,RETURN1
RC[0A] Q,RETURN1
RC[0B] Q,RETURN1
RC[0C] Q,RETURN1
RC[0D] Q,RETURN1
RC[0E] Q,RETURN1
RC[0F] Q,RETURN1
: THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
: INTO LA AND LB.

```

```

:2081
U 10E0, 0000,003E,0180,0A00,0000,0001 :2082
U 10E1, 0000,003E,0180,0A08,0000,0001 :2083
U 10E2, 0000,003E,0180,0A10,0000,0001 :2084
U 10E3, 0000,003E,0180,0A18,0000,0001 :2085
U 10E4, 0000,003E,0180,0A20,0000,0001 :2086
U 10E5, 0000,003E,0180,0A28,0000,0001 :2087
U 10E6, 0000,003E,0180,0A30,0000,0001 :2088
U 10E7, 0000,003E,0180,0A38,0000,0001 :2089
U 10E8, 0000,003E,0180,0A40,0000,0001 :2090
U 10E9, 0000,003E,0180,0A48,0000,0001 :2091
U 10EA, 0000,003E,0180,0A50,0000,0001 :2092
U 10EB, 0000,003E,0180,0A58,0000,0001 :2093
U 10EC, 0000,003E,0180,0A60,0000,0001 :2094
U 10ED, 0000,003E,0180,0A68,0000,0001 :2095
U 10EE, 0000,003E,0180,0A70,0000,0001 :2096
U 10EF, 0000,003E,0180,0A78,0000,0001 :2097
:2098
U 1120, 0000,003E,0180,0900,0000,0001 :2100
U 1121, 0000,003E,0180,0908,0000,0001 :2101
U 1122, 0000,003E,0180,0910,0000,0001 :2102
U 1123, 0000,003E,0180,0918,0000,0001 :2103
U 1124, 0000,003E,0180,0920,0000,0001 :2104
U 1125, 0000,003E,0180,0928,0000,0001 :2105
U 1126, 0000,003E,0180,0930,0000,0001 :2106
U 1127, 0000,003E,0180,0938,0000,0001 :2107
U 1128, 0000,003E,0180,0940,0000,0001 :2108
U 1129, 0000,003E,0180,0948,0000,0001 :2109
U 112A, 0000,003E,0180,0950,0000,0001 :2110
U 112B, 0000,003E,0180,0958,0000,0001 :2111
U 112C, 0000,003E,0180,0960,0000,0001 :2112
U 112D, 0000,003E,0180,0968,0000,0001 :2113
U 112E, 0000,003E,0180,0970,0000,0001 :2114
U 112F, 0000,003E,0180,0978,0000,0001 :2115
:2116
:2117
:2118
U 102C, 0F00,003D,0180,0800,0000,1222 :2119
U 102D, 0000,003C,0180,0800,0000,1030 :2120
:2121
U 1030, 0000,193D,0180,0800,0000,10A0 :2122
U 1031, 0819,0014,0580,0800,0010,1235 :2123
U 1235, 0000,013C,0180,0800,0000,1034 :2124
U 1034, 0000,003C,0180,0800,0000,1030 :2125
U 1035, 0000,003E,0180,0800,0000,0001 :2126
:2127
:2128
:2129
U 103C, 0F00,003D,0180,0800,0000,1222 :2130
U 103D, 0000,003C,0180,0800,0000,1040 :2131
:2132
U 1040, 0000,193D,0180,0800,0000,10C0 :2133
U 1041, 0819,0014,0580,0800,0010,1236 :2134
U 1236, 0000,013C,0180,0800,0000,1042 :2135

```

```

=0000
LTCHAB: LAB_R[0],RETURN1
LAB_R[1],RETURN1
LAB_R[2],RETURN1
LAB_R[3],RETURN1
LAB_R[4],RETURN1
LAB_R[5],RETURN1
LAB_R[6],RETURN1
LAB_R[7],RETURN1
LAB_R[8],RETURN1
LAB_R[9],RETURN1
LAB_R[0A],RETURN1
LAB_R[0B],RETURN1
LAB_R[0C],RETURN1
LAB_R[0D],RETURN1
LAB_R[0E],RETURN1
LAB_R[0F],RETURN1
: THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
=0000
LTCHRC: LC_RC[0],RETURN1
LC_RC[1],RETURN1
LC_RC[2],RETURN1
LC_RC[3],RETURN1
LC_RC[4],RETURN1
LC_RC[5],RETURN1
LC_RC[6],RETURN1
LC_RC[7],RETURN1
LC_RC[8],RETURN1
LC_RC[9],RETURN1
LC_RC[0A],RETURN1
LC_RC[0B],RETURN1
LC_RC[0C],RETURN1
LC_RC[0D],RETURN1
LC_RC[0E],RETURN1
LC_RC[0F],RETURN1
: THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
: CONTENTS OF Q.
=0
RARB.Q: D 0,CALL,J/DC.NF
NOP
=0
RARB.QA: CALL,D3-0?,J/WRRARB
D D+K[.1],CLK.UBCC
Z?
=0
J/RARB.QA
RETURN1
: THIS ROUTINE IS USED TO FILL ALL RC WITH THE
: CONTENTS OF Q.
=0
RC.Q: D 0,CALL,J/DC.NF
NOP
=0
RC.QA: CALL,D3-0?,J/WRRARB
D D+K[.1],CLK.UBCC
Z?

```

C 11

SEQ 0334
Page 5

[illegible]

```

:2138
:2139
:2140
:2141
:2142
:2143
:2144
:2145
:2146
:2147
:2148
:2149
:2150
:2151
:2152
:2153
:2154
:2155
:2156
:2157
:2158
:2159
:2160
:2161
:2162
:2163
:2164
:2165
:2166
:2167
:2168
U 1048, 0000,003D,0180,0800,0000,10BE
U 1049, 0018,0038,0980,09F8,0000,1237
U 1237, 0018,0038,6180,0A80,0000,104A
U 104A, 0000,003D,0180,0800,0000,1166
U 104B, 0000,003C,0180,0A00,0082,1238
U 1238, 0800,003C,0180,09E8,0100,1239
U 1239, 0000,003C,0180,0800,1400,723A
U 123A, 0018,0038,61C0,0800,0000,123B
U 123B, 081D,2000,01C0,0800,0000,1008
U 1008, 0000,173D,0180,0800,0000,1080
U 1009, 0001,203D,0180,09F0,0000,116E
U 100A, 0000,003C,0180,0A00,0010,100B
U 100B, 0000,013C,0180,0800,0000,104C
U 104C, 0018,0000,0580,0A80,0000,104B
U 104D, 0000,003C,0180,0800,0000,1050

```

```

.PAGE "TEST 90 BEN STATE<03:00> TEST"
*****
++
TEST 90 BEN STATE<03:00> TEST
TEST DESCRIPTION
THIS IS A TEST OF BEN 17 WHICH IS DEPENDENT UPON
THE CONTENTS OF THE STATE REGISTER'S BITS <03:00>.
ERROR DESCRIPTION
LOW ORDER FOUR BITS OF THE ADDRESS BRANCH WENT TO
CONTENTS OF STATE
--
*****
=0
STB1: NEWTST
RC[0F] K[.2]
RC[0] K[.F] ; SET UP COUNTER
=0
ERLOOP
STB1A: SC RC[0] ; GET THE TEST DATA, A COUNT PATTERN.
RC[0D] LA,FE_SC,D_ALU
STATE_FE ; LOAD DATA INTO STATE REGISTER
Q K[.F]
ALU Q-D,D_ALU,Q_ALU
=00 STATE3-0?CALL,J/BRTBLE ; TEST INSTRUCTION.
ERROR1,RC[0E] Q ; BRANCH WENT TO WRONG ADDRESS.
ALU_RC[0],CLK.DBCC ; TRIED ALL TEST PATTERNS?
Z?
=0 RC[0]_LA-K[.1],J/STB1A ; IF NOT DECREMENT PATTERN AND CONTINUE.
NOP

```



```

:2169
:2170
:2171
:2172
:2173
:2174
:2175
:2176
:2177
:2178
:2179
:2180
:2181
:2182
:2183
:2184
:2185
:2186
:2187
:2188
:2189
:2190
:2191
:2192
:2193
:2194
:2195
:2196
:2197
:2198
:2199
:2200
:2201
:2202
:2203
:2204
U 1050, 0000,003D,0180,0800,0000,10BE
U 1051, 0018,0038,0980,09F8,0000,123C
U 123C, 0018,0038,6180,0A80,0000,123D
U 123D, 0018,0038,CD80,0A88,0000,1052
U 1052, 0000,003D,0180,0800,0000,1166
U 1053, 0000,003C,0180,0A08,0082,123E
U 123E, 0800,003C,0180,09E8,0100,123F
U 123F, 0000,003C,0180,0800,1400,7240
U 1240, 0018,0038,61C0,0800,0000,1241
U 1241, 0800,003C,0180,0A00,0000,1242
U 1242, 081D,2000,01C0,0800,0000,1018
U 1018, 0000,163D,0180,0800,0000,1080
U 1019, 0001,203D,0180,09F0,0000,116E
U 101A, 0000,003C,1180,0A08,0084,701B
U 101B, 0003,001C,01C0,0800,0000,1243
U 1243, 001C,0000,0180,0A88,0000,1244
U 1244, 0000,003C,0180,0A00,0010,1245
U 1245, 0000,013C,0180,0800,0000,1058
U 1058, 0018,0000,0580,0A80,0000,1053
U 1059, 0000,003C,0180,0800,0000,105C

```

```

.PAGE "TEST 91 BEN STATE<07:04> TEST"
*****
++
TEST 91 BEN STATE<07:04> TEST
TEST DESCRIPTION
THIS IS A TEST OF BEN 16 WHICH IS DEPENDENT UPON
THE CONTENTS OF THE STATE REGISTER'S BIT2 <07:04>.
ERROR DESCRIPTION
LOW ORDER 4 BITS OF THE ADDRESS THE BRANCH ACTUALLY WENT TO
STATE REGISTER CONTENTS
--
*****
=0
STB2: NEWTST
RC[0F] K[.2] ; SET UP A CCOUNTER
RC[0] K[.F]
RC[1] K[.F0]
=0 ERLOOP
STB2A: SC R[1] ; GET TEST DATA, A COUNT PATTERN IN BITS<7:4>
RC[0D] LA,FE_SC,D_ALU ; LOAD STATE WITH DATA
STATE_FE
Q_K[.F]
D_R[0]
ALU Q-D,D_ALU,Q_ALU
=00 STATE7-4?CALL,J/BRTBLE ; TEST INSTRUCTION
ERROR1,RC[0E] Q ; BRANCH WENT TO WRONG ADDRESS
LAB_R[1],SC K[.4]
ALU_NOT.MASK,Q_ALU
ALU_LA[A-B]Q,R[1]_ALU
ALU_R[0],CLK.UBCC ; TRIED ALL APTTERNS YET
Z?
=0 R[0]_LA-K[.1],J/STB2A ; IF NOT CONTINUE
NOP

```

```

:2205 .PAGE 'TEST 92 BEN SS (SIGN SOURCE) TEST'
:2206 *****
:2207 ++
:2208 TEST 92 BEN SS (SIGN SOURCE) TEST
:2209
:2210 TEST DESCRIPTION
:2211 THIS IS A TEST OF THE BEN 12 BIT WHICH IS DEPENDENT
:2212 UPON THE STATE OF THE SS (SIGN SOURCE) BIT.
:2213
:2214 ERROR DESCRIPTION
:2215 NO ERROR DATA PRINT OUT USED
:2216
:2217 --
:2218 *****
:2219 =0
:2220 SSBEN: NEWTST
:2221 RC[OF]_K[ZERO]
:2222 SGN/7 ; CLEAR SS
:2223 BEN/EALU ; BRANCH BIT: SS=0
:2224 =1110 J/SSBEN1
:2225 ERROR1 ; BRANCH ASSERTED WITH SS=0
:2226 SSBEN1: SC_K[.F]
:2227 ALD NOT.MASK,SGN/1 ; SET SS
:2228 BEN7EALU ; BRANCH BIT=SS=1
:2229 =11110 ERROR1 ; BRANCH DEASSERTED WITH SS=1
:2230 NOP

```

U 105C, 0000,003D,0180,0800,0000,10BE
U 105D, 0018,0038,1980,09F8,0000,1246
U 1246, 0000,003C,0187,0800,0000,1247
U 1247, 0000,123C,0180,0800,0000,100E
U 100E, 0000,003C,0180,0800,0000,1248
U 100F, 0000,003D,0180,0800,0000,116E
U 1248, 0000,003C,6180,0800,0084,7249
U 1249, 0003,001C,0181,0800,0000,124A
U 124A, 0000,123C,0180,0800,0000,101E
U 101E, 0000,003D,0180,0800,0000,116E
U 101F, 0000,003C,0180,0800,0000,1070

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:2231
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:2240
:2241
:2242
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:2244
:2245
U 1070, 0000,003D,0180,0800,0000,10BE :2246
U 1071, 0018,0038,0580,09F8,0000,1072 :2247
U 1072, 0000,003D,0180,0800,0000,1166 :2248
U 1073, 0018,0038,1980,0A80,0000,124B :2249
U 124B, 0000,003C,0180,0A00,0000,124C :2250
U 124C, 0003,023C,0180,09F0,0000,1002 :2251
U 1002, 0000,003C,0180,0800,0000,107B :2252
U 1003, 0000,003D,0180,0800,0000,116E :2253
U 1005, 0000,003D,0180,0800,0000,116E :2254
U 1007, 0000,003D,0180,0800,0000,116E :2255
:2256
U 1078, 0000,003D,0180,0800,0000,1166 :2257
U 1079, 0018,0038,0580,0A80,0000,124D :2258
U 124D, 0000,003C,0180,0A00,0000,124E :2259
U 124E, 0018,0238,0580,09F0,0000,1012 :2260
U 1012, 0000,003D,0180,0800,0000,116E :2261
U 1013, 0000,003C,0180,0800,0000,107A :2262
U 1016, 0000,003D,0180,0800,0000,116E :2263
U 1017, 0000,003D,0180,0800,0000,116E :2264
:2265
U 107A, 0000,003D,0180,0800,0000,1166 :2266
U 107B, 0018,0038,0980,0A80,0000,124F :2267
U 124F, 0000,003C,0180,0A00,0000,1250 :2268
U 1250, 0018,0238,0980,09F0,0000,1022 :2269
U 1022, 0000,003D,0180,0800,0000,116E :2270
U 1023, 0000,003D,0180,0800,0000,116E :2271
U 1026, 0000,003C,0180,0800,0000,1090 :2272
U 1027, 0000,003D,0180,0800,0000,116E :2273
:2274
U 1090, 0000,003D,0180,0800,0000,1166 :2275
U 1091, 0018,0038,0D80,0A80,0000,1251 :2276
U 1251, 0000,003C,0180,0A00,0000,1252 :2277
U 1252, 0018,0238,0D80,09F0,0000,1032 :2278
U 1032, 0000,003D,0180,0800,0000,116E :2279
U 1033, 0000,003D,0180,0800,0000,116E :2280
U 1036, 0000,003D,0180,0800,0000,116E :2281
U 1037, 0000,003C,0180,0800,0000,1092 :2282

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```

.PAGE 'TEST 93 BEN LA<01:00> TEST'
*****
++
TEST 93 BEN LA<01:00> TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 2 WHICH IS DEPENDENT UPON
LA<01:00>
ERROR DESCRIPTION
EXPECTED LA <01:00>
--
*****
=0
ROR1: NEWTST
RC[0F]_K[.1]
=0 ERLOOP
R[0]_K[ZERO]
LAB R[0]
BEN7ROR,RC[0E]_0 ; LA<01:00>=00, TEST INSTRUCTION
=010 J/ROR2 ; BRANCH WENT TO WRONG ADDRESS
ERROR1
ERROR1
ERROR1
=0
ROR2: ERLOOP
R[0]_K[.1]
LAB R[0]
BEN7ROR,RC[0E]_K[.1] ; LA<01:00>=01, TEST INSTRUCTION
=010 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
J/ROR3
ERROR1
ERROR1
=0
ROR3: ERLOOP
R[0]_K[.2]
LAB R[0]
BEN7ROR,RC[0E]_K[.2] ; LA<01:00>=10, TEST INSTRUCTION
=010 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
ERROR1
J/ROR4
ERROR1
=0
ROR4: ERLOOP
R[0]_K[.3]
LAB R[0]
BEN7ROR,RC[0E]_K[.3] ; LA<01:00>=11, TEST INSTRUCTION
=010 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
ERROR1
ERROR1
NOP

```

```

:2283 .PAGE 'TEST 94 BEN D<01:00> (BEN/OC) TEST'
:2284 *****
:2285 ++
:2286 TEST 94 BEN D<01:00> (BEN/OC) TEST
:2287
:2288 TEST DESCRIPTION
:2289 THIS IS A TEST OF BEN C WHICH IS DEPENDENT UPON
:2290 D<01:00>
:2291
:2292 ERROR DESCRIPTION
:2293 THE LOW TWO BITS OF WHERE BRANCH WAS EXPECTED TO GO
:2294
:2295 --
:2296 *****
:2297 =0
U 1092, 0018,0039,0580,09F8,0000,10BE :2298 DBEN1: NEWTST[.1]
U 1093, 0F03,003C,0180,09F0,0000,1253 :2299 D 0,RC[0E] 0
U 1253, 0018,0038,C180,0800,0000,1254 :2300 ALU_K[.FFFF]
U 1254, 0100,0C3C,0380,0800,0000,1044 :2301 D D.LEFT2,SI/7,BEN/MUL ; D<01:00>=0C, TEST INSTRUCTION
U 1044, 0000,003C,0180,0800,0000,1098 :2302 =100 J/DBEN2
U 1045, 0000,003D,0180,0800,0000,116E :2303 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
U 1046, 0000,003D,0180,0800,0000,116E :2304 ERROR1
U 1047, 0000,003D,0180,0800,0000,116E :2305 ERROR1
:2306 =0
U 1098, 0000,003D,0180,0800,0000,1166 :2307 DBEN2: ERLOOP
U 1099, 0818,0038,0580,09F0,0000,1255 :2308 ALU_K[.1],D_ALU,RC[0E]_ALU
U 1255, 0018,0038,0980,0800,0000,1256 :2309 ALU_K[.2]
U 1256, 0100,0C3C,0380,0800,0000,1054 :2310 D D.LEFT2,SI/7,BEN/MUL ; D<01:00>=01, TEST INSTRUCTION
U 1054, 0000,003D,0180,0800,0000,116E :2311 =100 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
U 1055, 0000,003C,0180,0800,0000,109A :2312 J/DBEN3
U 1056, 0000,003D,0180,0800,0000,116E :2313 ERROR1
U 1057, 0000,003D,0180,0800,0000,116E :2314 ERROR1
:2315 =0
U 109A, 0000,003D,0180,0800,0000,1166 :2316 DBEN3: ERLOOP
U 109B, 0818,0038,0980,09F0,0000,1257 :2317 ALU_K[.2],D_ALU,RC[0E]_ALU
U 1257, 0018,0038,0580,0800,0000,1258 :2318 ALU_K[.1]
U 1258, 0100,0C3C,0380,0800,0000,1074 :2319 D D.LEFT2,SI/7,BEN/MUL ; D<01:00>=10, TEST INSTRUCTION
U 1074, 0000,003D,0180,0800,0000,116E :2320 =100 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
U 1075, 0000,003D,0180,0800,0000,116E :2321 ERROR1
U 1076, 0000,003C,0180,0800,0000,10B8 :2322 J/DBEN4
U 1077, 0000,003D,0180,0800,0000,116E :2323 ERROR1
:2324 =0
U 10B8, 0000,003D,0180,0800,0000,1166 :2325 DBEN4: ERLOOP
U 10B9, 0818,0038,0D80,09F0,0000,1259 :2326 ALU_K[.3],D_ALU,RC[0E]_ALU
U 1259, 0018,0038,1980,0800,0000,125A :2327 ALU_0(K)
U 125A, 0100,0C3C,0380,0800,0000,1094 :2328 D D.LEFT2,SI/7,BEN/MUL ; D<01:00>=11, TEST INSTRUCTION
U 1094, 0000,003D,0180,0800,0000,116E :2329 =100 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
U 1095, 0000,003D,0180,0800,0000,116E :2330 ERROR1
U 1096, 0000,003D,0180,0800,0000,116E :2331 ERROR1
U 1097, 0000,003C,0180,0800,0000,10BA :2332 NOP

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U 10BA, 0000,003D,0180,0800,0000,10BE
U 10BB, 0818,0038,8580,0800,0000,10D8
U 10D8, 0000,003D,0180,0800,0000,1065
U 10D9, 0001,003C,0180,0A80,0000,125B
U 125B, 0018,0038,4980,0A88,0000,125C
U 125C, 0018,0038,0980,09F8,0000,10DC
U 10DC, 0000,003D,0180,0800,0000,1166
U 10DD, 0800,003C,0180,0A08,0000,125D
U 125D, 0003,0F3C,0180,09E8,0000,10B1
U 10B1, 0000,003C,0180,0A08,0000,125E
U 10B3, 0001,003D,0180,09F0,0000,116E
U 10B5, 0001,003D,0180,09F0,0000,116E
U 10B7, 0001,003D,0180,09F0,0000,116E
U 125E, 0018,0000,0580,0A88,0000,125F
U 125F, 0000,003C,0180,0A00,0010,1260
U 1260, 0000,013C,0180,0800,0000,10F8
U 10F8, 0018,0000,0580,0A80,0000,10DD
U 10F9, 0018,0038,D980,0A80,0000,10FC
U 10FC, 0000,003D,0180,0800,0000,1166
U 10FD, 0800,003C,0180,0A08,0000,1261
U 1261, 0018,0F38,0580,09E8,0000,10D1
U 10D1, 0001,003D,0180,09F0,0000,116E
U 10D3, 0000,003C,0180,0A08,0000,1262
U 10D5, 0001,003D,0180,09F0,0000,116E
U 10D7, 0001,003D,0180,09F0,0000,116E
U 1262, 0018,0000,0580,0A88,0000,1263
U 1263, 0000,003C,0180,0A00,0010,1264
U 1264, 0000,013C,0180,0800,0000,110A
U 110A, 0018,0000,0580,0A80,0000,10FD
U 110B, 0800,003C,0180,0A08,0000,1265
U 1265, 0001,003C,0180,0A80,0000,1110
U 1110, 0000,003D,0180,0800,0000,1166
U 1111, 0800,003C,0180,0A08,0000,1266

```

```

.PAGE "TEST 95 BEN/OF TEST 1"
*****
**
TEST 95 BEN/OF TEST 1
TEST DESCRIPTION
THIS IS A TEST OF THE BEN F BIT WHICH IS DEPENDENT UPON
THE D REGISTER BEING WITHIN THE LIMITS:
30.LE.D<07:00>.LE.39 (IN HEX)
ERROR DESCRIPTION
D REGISTER
ERROR CODE:
0=> BRANCH FAILED TO BE DEASSERTED
1=> BRANCH FAILED TO BE ASSERTED
--
*****
=0
DDBEN1: NEWTST
D_K[C]
=0 CALL J/DC5
R[0] D ; R[0]=C6
R[1] K[FF]
R[0F] K[.2]
; BRANCH SHOULD NOT ASSERT WITH D= FF THRU 3A.
=0 ERLOOP
DDBEN2: D R[1]
BEN/DECIMAL,R[0D]_0 ; BRANCH BIT=0, TEST INSTRUCTION
=001 J/DDBEN3,LAB R[1]
ERROR1,R[0E]_D ; BRANCH WENT TO WRONG ADDRESS
ERROR1,R[0E]_D
ERROR1,R[0E]_D
DDBEN3: R[1] LA-K[.1] ; TRIED ALL PATTERNS FF THRU 3A?
ALU_R[0],CLK.UBCC
Z?
=0 R[0] LA-K[.1],J/DDBEN2 ; IF NOT CONTINUE
R[0] K[.9]
; BRANCH SHOULD ASSERT WITH D= 39 THRU 30
=0 ERLOOP
DDBEN4: D R[1]
BEN/DECIMAL,R[0D]_K[.1] ; BRANCH BIT=1, TEST INSTRUCTION
=001 ERROR1,R[0E]_D ; BRANCH WENT TO WRONG ADDRESS
J/DDBEN5,LAB R[1]
ERROR1,R[0E]_D
ERROR1,R[0E]_D
DDBEN5: R[1] LA-K[.1] ; TRIED ALL PATTERNS 39 THRU 30?
ALU_R[0],CLK.UBCC
Z?
=0 R[0] LA-K[.1],J/DDBEN4 ; IF NOT CONTINUE
D R[1]
R[0] D ; R[0]=2F
; BRANCH SHOULD NOT ASSERT WITH D= 2F THRU 00
=0 ERLOOP
DDBEN6: D_R[1]

```

U 1266.	0003,0F3C,0180,09E8,0000,10F1	:2388			
U 10F1.	0000,003C,0180,0A08,0000,1267	:2389	=001	BEN/DECIMAL,RC[0D]_0	: BRANCH BIT=0, TEST INSTRUCTION
U 10F3.	0001,003D,0180,09F0,0000,116E	:2390		J/DDBEN7,LAB,RC[1]	
U 10F5.	0001,003D,0180,09F0,0000,116E	:2391		ERROR1,RC[0E]_D	: BRANCH WENT TO WRONG ADDRESS
U 10F7.	0001,003D,0180,09F0,0000,116E	:2392		ERROR1,RC[0E]_D	
U 1267.	0018,0000,0580,0A88,0000,1268	:2393		ERROR1,RC[0E]_D	
U 1268.	0000,003C,0180,0A00,0010,1269	:2394	DDBEN7:	RC[1]_LA-K[.1]	: TRIED ALL PATTERNS 2F THRU 00?
U 1269.	0000,013C,0180,0800,0000,1114	:2395		ALU_R[0],CLK.UBCC	
U 1114.	0018,0000,0580,0A80,0000,1111	:2396	=0	Z?	
U 1115.	0000,003C,0180,0800,0000,1118	:2397		R[0]_LA-K[.1],J/DDBEN6	: IF NOT CONTINUE
				NOP	

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U 1118, 0000,003D,0180,0800,0000,10BE
U 1119, 0018,0038,6180,0A88,0000,126A
U 126A, 0018,0038,0580,09F8,0000,111C
U 111C, 0000,003D,0180,0800,0000,1166
U 111D, 0F00,003C,0180,0800,0000,1130
U 1130, 0000,003D,0180,0800,0000,1065
U 1131, 0000,003C,01E0,0800,0000,126B
U 126B, 0800,003C,0180,0A08,0000,126C
U 126C, 0819,0024,0180,0800,0000,126D
U 126D, 001D,2000,0180,0800,0010,126E
U 126E, 0000,013C,0180,0800,0000,1134
U 1134, 0000,003C,0180,0800,0000,126F
U 1135, 0000,003C,0180,0800,0000,1276
U 126F, 0018,0038,0DC0,0800,0000,1270
U 1270, 001D,2000,0180,0800,0010,1271
U 1271, 0000,013C,0180,0800,0000,1138
U 1138, 0000,003C,0180,0800,0000,1272
U 1139, 0000,003C,0180,0800,0000,1276
U 1272, 0019,0000,0580,0800,0010,1273
U 1273, 0000,013C,0180,0800,0000,113A
U 113A, 0000,003C,0180,0800,0000,1274
U 113B, 0000,003C,0180,0800,0000,1276
U 1274, 0800,003C,0180,0A08,0000,1275
U 1275, 0000,0F3C,0180,0800,0000,1112
U 1112, 0000,003C,0180,0800,0000,1278
U 1113, 0001,003D,0180,09F0,0000,116E
U 1116, 0001,003D,0180,09F0,0000,116E
U 1117, 0001,003D,0180,09F0,0000,116E
U 1276, 0800,003C,0180,0A08,0000,1277
U 1277, 0000,0F3C,0180,0800,0000,1132

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```

.PAGE "TEST 96 BEN/OF TEST 2"
*****
++
TEST 96 BEN/OF TEST 2

TEST DESCRIPTION
THIS IS A TEST OF THE BEN F BIT WHICH IS
ASSERTED WHEN:
D<02:00>=5
OR
D<02:00>=3
OR
D<02:00>=1

ERROR DESCRIPTION
D REGISTER
ERROR CODE:
0=> BRANCH FAILED TO BE DEASSERTED
1=> BRANCH FAILED TO BE ASSEF.TED

--
*****
=0
BDBEN1: NEWTST
R[1],K[F]
RC[0F],K[.1]
=0
ERLOOP
BDBEN2: D 0
=0
CALL,J/DC5
Q D : Q=5
D-R[1] : SEE IF D<2:0>=5
A[U_D.ANDNOT.K[.8],D_ALU
ALU_Q-D,CLK.UBCC
Z?
=0
J/BDBENA
J/BDBEN3 : IF YES THEN BRANCH WILL ASSERT.
BDBENA: Q K[.3] : SEE IF D<2:0>=3
A[U_Q-D,CLK.UBCC
Z?
=0
J/BDBENB
J/BDBEN3 : IF YES THEN BRANCH WILL ASSERT
BDBENB: ALU_D-K[.1],CLK.UBCC : SEE IF D<2:0>=1
Z?
=0
J/BDBENC
J/BDBEN3 : IF NOT THEN BRANCH WILL NOT ASSERT
: IF YES THEN BRANCH WILL ASSERT
: COME HERE IF BRANCH WILL NOT ASSERT:
BDBENC: D R[1]
BEN/DECIMAL : BRANCH BIT=0, TEST INSTRUCTION
=010
J/BDBEN4
ERROR1,RC[OE]_D : BRANCH WENT TO WRONG ADDRESS
ERROR1,RC[OE]_D
ERROR1,RC[OE]_D
: COME HERE IF BRANCH SHOULD ASSERT:
BDBEN3: D R[1]
BEN/DECIMAL : BRANCH BIT=1, TEST INSTRUCTION

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ZZ-ESKAH-V132 TEST 96 BEN/OF TEST 2
ESKAH26.MCR MICRO2 1M(01)

L 11

16-DEC-82 11:03:36

SEQ 0343
Page 6

U 1132,	0001,003D,0180,09F0,0000,116E	:2453	=010	ERROR1,RC[OE]_D	: BRANCH WENT TO WRONG ADDRESS
U 1133,	0000,003C,0180,0800,0000,1278	:2454		J/BDBEN4	
U 1136,	0001,003D,0180,09F0,0000,116E	:2455		ERROR1,RC[OE]_D	
U 1137,	0001,003D,0180,09F0,0000,116E	:2456		ERROR1,RC[OE]_D	
U 1278,	0000,003C,0180,0A08,0010,1279	:2457	BDBEN4:	ALU_R[1],CLK.DBCC	: TRIED ALL TEST PATTERNS?
U 1279,	0000,013C,0180,0800,0000,113C	:2458		Z?	
U 113C,	0018,0000,0580,0A88,0000,111D	:2459	=0	R[1]_LA-K[.1],J/BDBEN2	: IF NOT CONTINUE
U 113D,	0000,003C,0180,0800,0000,1140	:2460		NOP	


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U 1140, 0000,003D,0180,0800,0000,10BE
U 1141, 0018,0038,0580,09F8,0000,127A
U 127A, 0000,003C,E580,0800,0084,727B
U 127B, 0003,0010,01C0,0800,0000,127C
U 127C, 0000,003C,0580,0800,0084,B27D
U 127D, 0000,003C,1180,0800,0084,B27E
U 127E, 0803,0010,0180,0800,0000,127F
U 127F, 081D,0024,0180,0AB0,0000,1280
U 1280, 0000,003C,5D80,0800,0084,7281
U 1281, 0000,003C,0180,0800,0000,1282
U 1282, 0000,003C,8D80,0800,0084,7283
U 1283, 0001,0034,0180,0AB8,0000,1284
U 1284, 0000,003C,2180,0800,0084,7285
U 1285, 0803,001C,0180,0AA8,0000,1286
U 1286, 0001,003C,0180,0AA0,0000,1142
U 1142, 0000,003D,0180,0800,0000,1166
U 1143, 0800,003C,0180,0A20,0000,1287
U 1287, 0001,003C,0180,09F0,0000,1288
U 1288, 0000,003C,0180,0800,0000,1156
U 1156, 0000,003C,0180,0800,0000,1149
U 1157, 001C,2034,0180,0A30,0010,1289
U 1289, 0000,013C,0180,0800,0000,1144
U 1144, 0000,003C,0180,0800,0000,1149
U 1145, 001C,2034,0180,0A38,0010,128A
U 128A, 0000,013C,0180,0800,0000,1148
U 1148, 0000,003C,0180,0800,0000,128B
U 1149, 0000,1D3C,0180,0800,0000,102F
U 102F, 0018,0039,0580,09E8,0000,116E
U 103F, 0000,003C,0180,0800,0000,128C
U 128B, 0000,1D3C,0180,0800,0000,104F
U 104F, 0000,003C,0180,0800,0000,128C
U 105F, 0003,003D,0180,09E8,0000,116E
U 128C, 0800,003C,0180,0A20,0010,128D
U 128D, 0000,013C,0180,0A28,0000,114A
U 114A, 001C,2014,0180,0AA0,0000,1143
U 114B, 0000,003C,0180,0800,0000,114C

```

```

.PAGE "TEST 97 BEN PTE VALID TEST"
*****
++
TEST 97 BEN PTE VALID TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 1D BIT WHICH IS ASSERTED
WHEN THE D REGISTER CONTAINS A VALID TRANSLATION BUFFER
PTE. A VALID PTE IS ONE IN WHICH BITS <25:21>=0.
ERROR DESCRIPTION
D REGISTER CONTENTS
--
*****
=0
PTEV1: NEWTST
RC[0F],K[.1]
SC K[.TA] ; GENERATE SCME DATA PATTERNS.
ALU_MASK+1,Q_ALU ; Q=FC000000
SC SC-K[.1]
SC SC-K[.4]
ALU_MASK+1,D_ALU ; D=FFE00000
ALU_D[ANDNOT]Q,D_ALU,R[6]_ALU ; R[6]=03E00000
SC R[.7]
D DAL.SC ; D=E0000000
SC K[.1F]
ALU D.AND.MASK,R[7]_ALU ; R[7]=60000000
SC R[.14]
ALU NOT.MASK,R[5]_ALU,D_ALU ; R[5]=00100000, TEST PATTERN INCREMENT
R[4] D ; R[4]=00100000, INITIAL TEST PATTERN
=0
PTEV2: ERLOOP
D R[4] ; DETERMINE IF THE CURRENT
RC[0E]_D ; TEST PATTERN IS A VALID PTE
D31? ; OR NOT
=110 J/PTEINV ; PTE INVALID
LAB_R[6],ALU_LA[AND]D,CLK.UBCC
Z?
=0 J/PTEINV ; PTE INVALID
LAB_R[7],ALU_LA[AND]D,CLK.UBCC
Z?
=0 J/PTEVAL ; PTE VALID
; THE DATA PATTERN IS AN INVALID PTE SO THE BRANCH BIT SHOULD ASSERT
PTEINV: BEN/TB.TEST ; BRANCH BIT IS 1, TEST INSTRUCTION
=01111 ERROR1,RC[0D],K[.1] ; BRANCH WENT TO WRONG ADDRESS
J/PTEV4
; THE DATA PATTERN IS A VALID PTE SO THE BRANCH BIT SHOULD NOT ASSERT
PTEVAL: BEN/TB.TEST ; BRANCH BIT IS 0, TEST INSTRUCTION.
=01111 J/PTEV4
ERROR1,RC[0D] 0 ; BRANCH WENT TO WRONG ADDRESS.
PTEV4: D R[4],CLK.UBCC ; SEE IF ALL TEST PATTERNS HAVE BEEN TRIED.
LAB_R[5],Z? ; IF NOT INCREMENT THE TEST
=0 ALU_LA[A+B]D,R[4]_ALU,J/PTEV2 ; PATTERN AND CONTINUE.
NOP

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```
.PAGE  "TEST 98  BEN PSL<27>, FPD, TEST"
*****
++
TEST 98  BEN PSL<27>, FIRST PART DONE, TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 11 BIT WHICH IS DEPENDENT UPON
NOT PSL BIT <27> (NOT FIRST PART DONE).
ERROR DESCRIPTION
ERROR CODE:
0=> BRANCH FAILED TO BE DEASSERTED
1=> BRANCH FAILED TO BE ASSERTED
--
*****
=0
FPDB:  NEWTSTC.1]
      SC K[.1B]
      ALD NOT.MASK,D_ALU      : D=8000000
      ID[PSL]_D               : SET THE PSL<27>
      FPD?                    : TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
=0111  J/FPDB1
      ERROR1,RC[OE]_0         : BRANCH WENT TO WRONG ADDRESS
=0
FPDB1:  ERLOOP
      SC K[.1B]
      ALD MASK,D_ALU         : D=F7FFFFFFF
      ID[PSL]_D               : CLEAR PSL<27>
      FPD?                    : TEST INSTRUCTION, BRANCH SHOULD ASSERT
=0111  ERROR1,RC[OE]_K[.1]   : BRANCH WENT TO WRONG ADDRESS
      NOP
=0
FPDB2:  ERLOOP
      SC K[.1B]
      ALD NOT.MASK,D_ALU     : D=8000000
      ID[PSL]_D               : SET PSL<27>
      FPD?                    : BRANCH SHOULD ASSERT
=0111  J/FPDB3
      ERROR1                  : BRANCH WENT TO WRONG ADDRESS
FPDB3:  NOP
```

U 114C, 0018,0039,0580,09F8,0000,10BE
U 114D, 0000,003C,ED80,0800,0084,728E
U 128E, 0803,001C,0180,0800,0000,128F
U 128F, 0000,003C,3D80,3C00,0000,1290
U 1290, 0000,113C,0180,0800,0000,1147
U 1147, 0000,003C,0180,0800,0000,1150
U 114F, 0003,003D,0180,09F0,0000,116E

U 1150, 0000,003D,0180,0800,0000,1166
U 1151, 0000,003C,ED80,0800,0084,7291
U 1291, 0800,0038,0180,0800,0000,1292
U 1292, 0000,003C,3D80,3C00,0000,1293
U 1293, 0000,113C,0180,0800,0000,1167
U 1167, 0018,0039,0580,09F0,0000,116E
U 116F, 0000,003C,0180,0800,0000,1152

U 1152, 0000,003D,0180,0800,0000,1166
U 1153, 0000,003C,ED80,0800,0084,7294
U 1294, 0803,001C,0180,0800,0000,1295
U 1295, 0000,003C,3D80,3C00,0000,1296
U 1296, 0000,113C,0180,0800,0000,1187
U 1187, 0000,003C,0180,0800,0000,1297
U 118F, 0000,003D,0180,0800,0000,116E
U 1297, 0000,003C,0180,0800,0000,1158

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U 1158, 0000,003D,0180,0800,0000,10BE
U 1159, 0018,0038,0580,09F8,0000,1298
U 1298, 0F00,003C,0180,0800,0000,1299
U 1299, 0000,003C,3D80,3C00,0000,129A
U 129A, 0000,1C3C,0180,0800,0000,107D
U 107D, 0018,0039,0580,09F0,0000,116E
U 107F, 0000,003C,0180,0800,0000,115A
U 115A, 0000,003D,0180,0800,0000,1166
U 115B, 0000,003C,8D80,0800,0084,729B
U 129B, 0803,001C,0180,0800,0000,129C
U 129C, 0000,003C,3D80,3C00,0000,129D
U 129D, 0000,1C3C,0180,0800,0000,109D
U 109D, 0000,003C,0180,0800,0000,115C
U 109F, 0003,003D,0180,09F0,0000,116E

U 115C, 0000,003D,0180,0800,0000,1166
U 115D, 0000,003C,E580,0800,0084,729E
U 129E, 0803,001C,0180,0800,0000,129F
U 129F, 0000,003C,3D80,3C00,0000,12A0
U 12A0, 0000,1C3C,0180,0800,0000,10BD
U 10BD, 0000,003C,0180,0800,0000,12A1
U 10BF, 0018,0039,0580,09F0,0000,116E
U 12A1, 0F00,003C,0180,0800,0000,12A2
U 12A2, 0000,003C,3D80,3C00,0000,1160

```

```

.PAGE "TEST 99 BEN/1C TEST"
*****
**
TEST 99 BEN/1C TEST
TEST DESCRIPTION
THIS IS A TEST OF THE BEN 1C BIT WHICH IS ASSERTED BY:
(-PSL<IS>)*(-PSL<CM>)

ERROR DESCRIPTION
ERROR CODE:
0=> BRANCH FAILED TO BE DEASSERTED
1=> BRANCH FAILED TO BE ASSERTED

--
*****
=0
ISCMB: NEWTST
RC[OF]_K[.1]
D 0
ID[PSL] D : CLEAR THE PSL
PSL.MODE? : TEST INSTRUCTION, BRANCH SHOULD ASSERT
=11101 ERROR1,RC[OE]_K[.1] : BRANCH WENT TO WRONG ADDRESS
NOP
=0 ERLOOP
SC_K[.1F]
ALD NOT.MASK,D_ALU : D=80000000
ID[PSL] D : SET PSL<1F>
PSL.MODE? : TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
=11101 J/ISCMB1
ERROR1,RC[OE]_0 : BRANCH WENT TO WRONG ADDRESS
=0
ISCMB1: ERLOOP
SC_K[.1A]
ALD NOT.MASK,D_ALU : D=40000000
ID[PSL] D : SET PSL<26>
PSL.MODE? : TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
=11101 J/ISCMB2
ERROR1,RC[OE]_K[.1] : BRANCH WENT TO WRONG ADDRESS
ISCMB2: D 0
ID[PSL]_D

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:2597 .PAGE 'TEST 9A NESTED ERROR BIT, BEN/NEST.ERR AND CES<NEST.ERR> TES
:2598 *****
:2599 ++
:2600 TEST 9A NESTED ERROR BIT TEST
:2601
:2602 TEST DESCRIPTION
:2603 THIS IS A TEST OF THE MSC FIELD FUNCTIONS WHICH SET AND CLEAR
:2604 THE NEST.ERROR FLAG. ALSO TESTED IS THE BEN 11 BIT WHICH
:2605 IS ASSERTED BY NESTED ERROR BEING SET.
:2606 THE CES<16> NESTED ERROR BIT IS ALSO TESTED.
:2607
:2608 ERROR DESCRIPTION
:2609 EXPECTED CES REGISTER, JUST BIT 16 IS PERTAINENT
:2610 GOT CES REGISTER, JUST BIT 16 IS PERTAINENT
:2611 ERROR CODE:
:2612 0=> BRANCH FAILED TO BE DEASSERTED
:2613 1=> BRANCH FAILED TO BE ASSERTED
:2614 2=> *NOT* A BRANCH FAILURE
:2615 *NOTE* IF ERROR CODE =0 .OR. 1, THEN IGNORE THE FIRST TWO
:2616 ERROR WORDS.
:2617
:2618 --
:2619 *****
:2620 =0
:2621 NESTR: NEWTST
:2622 RC[0F]_K[.3]
:2623 =0
:2624 ERLOOP
:2625 MSC/CLR.NEST.ERR ; CLEAR THE NESTED ERROR BIT
:2626 NEST.ERR? ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
:2627 =1011 J/NESTR1
:2628 ERROR1,RC[0C]_0 ; BRANCH WENT TO WRONG ADDRESS
:2629 =0
:2630 NESTR1: ERLOOP
:2631 MSC/SET.NEST.ERR ; SET THE NESTED ERROR BIT.
:2632 NEST.ERR? ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
:2633 =1011 ERROR1,RC[0C]_K[.1] ; BRANCH WENT TO WRONG ADDRESS
:2634 NOP
:2635 =0
:2636 ERLOOP
:2637 MSC/CLR.NEST.ERR ; CLEAR THE NESTED ERROR BIT
:2638 NEST.ERR? ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
:2639 =1011 J/NESTR2
:2640 ERROR1,RC[0C]_0 ; BRANCH WENT TO WRONG ADDRESS
:2641 NESTR2: RC[0C]_K[.2]
:2642 =0
:2643 ERLOOP
:2644 SC K[.10]
:2645 ALD NOT.MASK,RC[0E]_ALU ; RC[0E]=10000
:2646 MSC7SET.NEST.ERR ; SET THE NESTED ERROR BIT
:2647 Q_ID[CES] ; CHECK CES<16>
:2648 RC[0D] Q
:2649 ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS CES<16>=1?
:2650 Z?
:2651 =0
:2652 J/NESTR3
:2653 ERROR1 ; CES NESTED ERROR BIT INCORRECT
:2654 =0
:2655 NESTR3: ERLOOP

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U 1160, 0000,003D,0180,0800,0000,10BE
U 1161, 0018,0038,0D80,09F8,0000,1162
U 1162, 0000,003D,0180,0800,0000,1166
U 1163, 0000,003C,0180,0800,2800,12A3
U 12A3, 0000,113C,0180,0800,0000,119B
U 119B, 0000,003C,0180,0800,0000,1164
U 119F, 0003,003D,0180,09E0,0000,116E

U 1164, 0000,003D,0180,0800,0000,1166
U 1165, 0000,003C,0180,0800,2C00,12A4
U 12A4, 0000,113C,0180,0800,0000,11AB
U 11AB, 0018,0039,0580,09E0,0000,116E
U 11AF, 0000,003C,0180,0800,0000,1168
U 1168, 0000,003D,0180,0800,0000,1166
U 1169, 0000,003C,0180,0800,2800,12A5
U 12A5, 0000,113C,0180,0800,0000,11BB
U 11BB, 0000,003C,0180,0800,0000,12A6
U 11BF, 0003,003D,0180,09E0,0000,116E
U 12A6, 0018,0038,0980,09E0,0000,116A
U 116A, 0000,003D,0180,0800,0000,1166
U 116B, 0000,003C,6580,0800,0084,72A7
U 12A7, 0003,001C,0180,09F0,0000,12A8
U 12A8, 0000,003C,0180,0800,2C00,12A9
U 12A9, 0000,003C,31F0,2C00,0000,12AB
U 12AB, 0001,203C,0180,09E8,0000,12AC
U 12AC, 0001,2024,0180,0800,0010,12AD
U 12AD, 0000,013C,0180,0800,0000,116C
U 116C, 0000,003C,0180,0800,0000,1170
U 116D, 0000,003D,0180,0800,0000,116E

U 1170, 0000,003D,0180,0800,0000,1166

U 1171,	0003,003C,0180,09F0,0000,12AE	:2652	RC[OE] 0	
U 12AE,	0000,003C,0180,0800,2800,12AF	:2653	MSC/CLR.NEST.ERR	; CLEAR NESTED ERROR BIT
U 12AF,	0000,003C,31F0,2C00,0000,12B0	:2654	Q_ID[CES]	; CHECK CES<16>
U 12B0,	0001,203C,0180,09E8,0000,12B1	:2655	RC[OD] Q	
U 12B1,	0001,2024,0180,0800,0010,12B2	:2656	ALU_Q.ANDNOT.MASK,CLK.UBCC	; WAS CES NESTED ERROR BIT CORRECT
U 12B2,	0000,013C,0180,0800,0000,1172	:2657	Z?	
U 1172,	0000,003D,0180,0800,0000,116E	:2658	ERROR1	; CES NESTED ERROR BIT INCORRECT.
U 1173,	0000,003C,0180,0800,0000,1178	:2659	NOP	
U 1178,	0000,003D,0180,0800,0000,1166	:2660	ERLOOP	
U 1179,	0003,001C,0180,09F0,0000,12B3	:2661	RC[OE] ALU,ALU NOT.MASK	; RC[OE]=10000
U 12B3,	0000,003C,0180,0800,2C00,12B4	:2662	MSC/SET.NEST.ERR	; SET CES NESTED ERROR BIT
U 12B4,	0000,003C,31F0,2C00,0000,12B5	:2663	Q_ID[CES]	; READ CES REGISTER
U 12B5,	0001,203C,0180,09E8,0000,12B6	:2664	RC[OD] Q	
U 12B6,	0001,2024,0180,0800,0010,12B7	:2665	ALU_Q.ANDNOT.MASK,CLK.UBCC	; WAS CES CORRECT?
U 12B7,	0000,013C,0180,0800,0000,117A	:2666	Z?	
U 117A,	0000,003C,0180,0800,0000,12B8	:2667	J/NESTR4	
U 117B,	0000,003D,0180,0800,0000,116E	:2668	ERROR1	; CES NESTED ERROR BIT INCORRECT
U 12B8,	0000,003C,0180,0800,2800,117C	:2669	NESTR4: MSC/CLR.NEST.ERR	

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U 117C, 0000,003D,0180,0800,0000,10BE :2690
U 117D, 0018,0038,6180,0A98,0000,1180 :2691
U 1180, 0000,003D,0180,0800,0000,1166 :2692
U 1181, 0018,0038,0D80,09F8,0000,12B9 :2693
U 12B9, 0003,003C,0180,09E0,0000,12BA :2694
U 12BA, 0800,003C,0180,0A18,0000,12BB :2695
U 12BB, 0001,003C,0180,09E8,0000,12BC :2696
U 12BC, 0000,003C,3D80,3C00,0000,12BD :2697
U 12BD, 0018,0038,61C0,0800,0000,12BE :2698
U 12BE, 081D,2000,01C0,0800,0000,1028 :2699
U 1028, 0000,1A3D,0180,0800,0000,1080 :2700
U 1029, 0001,203D,0180,09F0,0000,116E :2701
:2702
U 102A, 0018,0038,0580,09E0,0000,102B :2703
U 102B, 0800,003C,0180,0A18,0000,12BF :2704
U 12BF, 0019,0034,0580,0800,0010,12C0 :2705
U 12C0, 0000,013C,0180,0800,0000,1182 :2706
U 1182, 0000,003C,0180,0800,0000,12C1 :2707
U 1183, 0000,023C,0180,0800,0000,1175 :2708
U 1175, 0000,003C,0180,0800,0000,1197 :2709
U 1177, 0000,003D,0180,0800,0000,116E :2710
U 12C1, 0000,023C,0180,0800,0000,1195 :2711
U 1195, 0000,003D,0180,0800,0000,116E :2712
U 1197, 0000,003C,0180,0A18,0010,12C2 :2713
U 12C2, 0000,013C,0180,0800,0000,1184 :2714
U 1184, 0018,0000,0580,0A98,0000,1181 :2715
U 1185, 0000,003C,0180,0800,0000,1188 :2716

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.PAGE "TEST 9B BEN PSL.CC TEST"
*****
++
TEST 9B BEN PSL.CC TEST

TEST DESCRIPTION
THIS IS A TEST OF BEN 1A WHICH IS DEPENDENT UPON THE
PSL CC (PSL<3:0>) AND ALSO A TEST OF THE BEN 2 BIT WHICH IS
ASSERTED BY PSL C BIT (PSL<0>).

ERROR DESCRIPTION
LOW ORDER 4 BITS OF WHERE THE BRANCH ACTUALLY WENT
TEST DATA IN PSL
ERROR CODE:
0=> BEN 1A FAILED
1=> BEN 2 FAILED
--
*****
=0
PSLCC: NEWTST
R[3]_K[F] ; INITIALIZE A COUNT DATA PATTERN
=0
ERLOOP
PSLCC1: R[0F]_K[.3]
R[0C]_0
D_R[3]
R[0D]_D
ID[PSL]_D ; SET UP PSL.CC
Q_K[F]
=00
A[U_Q-D,D,ALU,Q,ALU ; TEST INSTRUCTION
CALL,PSL.CC?,J/BRTBLE ; BRANCH WENT TO WRONG ADDRESS
R[0E]_Q,ERROR1
: NOW TEST BEN72
R[0C]_K[.1]
D_R[3]
A[U_D[AND]K[.1],CLK,UBCC
Z?
=0
J/PSLCC2
BEN/ROR ; BRANCH (BEN/2) SHOULD NOT ASSERT
=101
J/PSLCC3
ERROR1 ; BRANCH WENT TO WRONG ADDRESS
PSLCC2: BEN/ROR ; BRANCH (BEN/2) SHOULD ASSERT
=101
ERROR1 ; BRANCH WENT TO WRONG ADDRESS
PSLCC3: ALU_R[3],CLK,UBCC ; TRIED ALL DATA PATTERNS
Z?
=0
R[3]_LA-K[.1],J/PSLCC1 ; IF NOT CONTINUE
NOP

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:2717 .PAGE "TEST 9C BEN/1C, CONSOLE MODE, TEST"
:2718 *****
:2719 ++
:2720 TEST 9C BEN/1C, CONSOLE MODE, TEST
:2721
:2722 TEST DESCRIPTION
:2723 THIS IS A TEST OF THE BEN 1C BIT WHICH IS ASSERTED WHEN NOT
:2724 IN CONSOLE MODE.
:2725
:2726 ERROR DESCRIPTION
:2727 ERROR CODE:
:2728 0=> BRANCH FAILED TO BE DEASSERTED
:2729 1=> BRANCH FAILED TO BE ASSERTED
:2730
:2731 --
:2732 *****
:2733 =0
:2734 CONBEN: NEWTST
:2735 RC[OF]_K[.1]
:2736 =0 ERLOOP
:2737 FS/CID,CID/CONT ; CLEAR CONSOLE MODE
:2738 CONSOLE.MODE? ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
:2739 =11011 ERROR1,RC[OE]_K[.1] ; BRANCH WENT TO THE WRONG ADDRESS
:2740 NOP
:2741 =0 ERLOOP
:2742 FS/CID,CID/ACK ; SET CONSOLE MODE
:2743 CONSOLE.MODE? ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
:2744 =11011 J/CONB1
:2745 ERROR1,RC[OE]_0 ; BRANCH WENT TO THE WRONG ADDRESS
:2746 =0
:2747 CONB1: ERLOOP
:2748 FS/CID,CID/CONT ; CLEAR CONSOLE MODE
:2749 CONSOLE.MODE? ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
:2750 =11011 ERROR1,RC[OE]_K[.1] ; BRANCH WENT TO WRONG ADDRESS
:2751 NOP

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U 1188, 0000,003D,0180,0800,0000,10BE
U 1189, 0018,0038,0580,09F8,0000,118A
U 118A, 0000,003D,0180,0800,0000,1166
U 118B, 0000,003C,0180,1C00,0000,12C3
U 12C3, 0000,1C3C,0180,0800,0000,10DB
U 10DB, 0018,0039,0580,09F0,0000,116E
U 10DF, 0000,003C,0180,0800,0000,118C
U 118C, 0000,003D,0180,0800,0000,1166
U 118D, 0000,003C,0180,1400,0000,12C4
U 12C4, 0000,1C3C,0180,0800,0000,10FB
U 10FB, 0000,003C,0180,0800,0000,1190
U 10FF, 0003,003D,0180,09F0,0000,116E

U 1190, 0000,003D,0180,0800,0000,1166
U 1191, 0000,003C,0180,1C00,0000,12C5
U 12C5, 0000,1C3C,0180,0800,0000,111B
U 111B, 0018,0039,0580,09F0,0000,116E
U 111F, 0000,003C,0180,0800,0000,1192

```

:2752 .PAGE 'TEST 9D BEN/1C, KERNAL MODE, TEST'
:2753 *****
:2754 **
:2755 TEST 9D BEN/1C, KERNAL MODE, TEST
:2756
:2757 TEST DESCRIPTION
:2758 THIS IS A TEST OF THE BEN PSL MODE BIT WHICH IS ASSERTED
:2759 WHEN IN KERNAL MODE (PSL<25:24>=00).
:2760
:2761 ERROR DESCRIPTION
:2762 ERROR CODE:
:2763 BIT <00> = 0 => BRANCH FAILED TO BE DEASSERTED
:2764 BIT <00> = 1 => BRANCH FAILED TO BE ASSERTED
:2765 BITS <02:01> = EXPECTED PSL <25:24>
:2766
:2767 --
:2768 *****
:2769 =0

```

```

U 1192, 0000,003D,0180,0800,0000,10BE
U 1193, 0018,0038,0580,09F8,0000,12C6
U 12C6, 0F00,003C,0180,0800,0000,12C7
U 12C7, 0000,003C,3D80,3C00,0000,12C8
U 12C8, 0000,1C3C,0180,0800,0000,113E
U 113E, 0018,0039,0580,09F0,0000,116E
U 113F, 0000,003C,0180,0800,0000,1198
U 1198, 0000,003D,0180,0800,0000,1166
U 1199, 0000,003C,7D80,0800,0084,72C9
U 12C9, 0803,001C,0180,0800,0000,12CA
U 12CA, 0000,003C,3D80,3C00,0000,12CB
U 12CB, 0000,1C3C,0180,0800,0000,115E
U 115E, 0000,003C,0180,0800,0000,119C
U 115F, 0018,0039,0980,09F0,0000,116E

U 119C, 0000,003D,0180,0800,0000,1166
U 119D, 0000,003C,B980,0800,0084,72CC
U 12CC, 0803,001C,0180,0800,0000,12CD
U 12CD, 0000,003C,3D80,3C00,0000,12CE
U 12CE, 0000,1C3C,0180,0800,0000,117E
U 117E, 0000,003C,0180,0800,0000,12CF
U 117F, 0018,0039,1180,09F0,0000,116E
U 12CF, 0000,003C,0180,0800,0000,11A8

```

```

:2770 KMODE: NEWTST
:2771 RC[0F]_K[.1]
:2772 D 0
:2773 ID[PSL] D ; PSL=0
:2774 PSL.MODE? ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
:2775 =11110 ERROR1,RC[0E]_K[.1] ; BRANCH WENT TO THE WRONG ADDRESS
:2776 NOP
:2777 =0 ERLOOP
:2778 SC_K[.18]
:2779 ALD NOT.MASK,D_ALU ; D=1000000
:2780 ID[PSL] D ; SET PSL<24>
:2781 PSL.MODE? ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
:2782 =11110 J/KMODE1
:2783 ERROR1,RC[0E]_K[.2] ; BRANCH WENT TO THE WRONG ADDRESS
:2784 =0
:2785 KMODE1: ERLOOP
:2786 SC_K[.19]
:2787 ALD NOT.MASK,D_ALU ; D=2000000
:2788 ID[PSL] D ; SET PSL<25>
:2789 PSL.MODE? ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
:2790 =11110 J/KMODE2
:2791 ERROR1,RC[0E]_K[.4] ; BRANCH WENT TO THE WRONG ADDRESS
:2792 KMODE2: NOP

```



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:2793 .PAGE "TEST 9E BRANCH ENABLE 3 -- ALU C BIT"
:2794 *****
:2795 ++
:2796 TEST 9E BRANCH ENABLE 3 -- ALU C BIT
:2797
:2798 TEST DESCRIPTION
:2799 THIS TEST CHECKS THAT ALU CARRY 31 IS ENABLED IN BIT POSITION 1
:2800 DURING A BRANCH ENABLE 3.
:2801
:2802 LOGIC DESCRIPTION
:2803 THIS TEST CHECKS BRANCH MULTIPLEXOR ON THE USC MODULE.
:2804
:2805 ERROR DESCRIPTION
:2806 DATA: EXPECTED BRANCH BIT
:2807 RECEIVED BRANCH BIT
:2808
:2809 SYNC POINT DESCRIPTION
:2810 SYNC05 -- ALU C(31) IS ENABLED ONTO THE UPC
:2811 SYNC06 -- ALU C(31) IS ENABLED ONTO THE UPC
:2812 -
:2813 *****
:2814 =0
:2815 T002: NEWTST[.2]
:2816 RC[OE]_D_0 ; SET THE EXPECTED DATA
:2817 ID[CES]_D ; LOAD THE BRANCH BIT
:2818 =0 ERLOOP
:2819 NOP
:2820 =0
:2821 SYNC05: C31?,CALL,J/BEN03,D_0 ; EXECUTE THE BRANCH
:2822 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
:2823 Z?
:2824 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
:2825 RC[OE]_K[.2]
:2826 D_K[.80]
:2827 ID[CES]_D ; SET THE BRANCH BIT
:2828 =0 ERLOOP
:2829 NOP
:2830 =0
:2831 SYNC06: C31?,CALL,J/BEN03,D_K[.2] ; EXECUTE THE BRANCH
:2832 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
:2833 Z?
:2834 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
:2835 J/ENDT002
:2836 =000
:2837 BEN03: Q_0,RETURN1
:2838 Q_K[.1],RETURN1
:2839 Q_K[.2],RETURN1
:2840 Q_K[.3],RETURN1
:2841 Q_K[.4],RETURN1
:2842 Q_K[.4],J/INCREMENTQ
:2843 Q_K[.6],RETURN1
:2844 Q_K[.7],RETURN1
:2845 INCREMENTQ:
:2846 Q_Q+K[.1],RETURN1
:2847 ENDT002:NOP

```

```

U 11A8, 0018,0039,0980,09F8,0000,10BE
U 11A9, 0F03,003C,0180,09F0,0000,12D0
U 12D0, 0000,003C,3180,3C00,0000,11AC
U 11AC, 0000,003D,0180,0800,0000,1166
U 11AD, 0000,003C,0180,0800,0000,11B6
:2820
U 11B6, 0F00,033D,0180,0800,0000,11A0
U 11B7, 001D,2000,0180,0800,0010,12D1
U 12D1, 0000,013C,0180,0800,0000,11B8
U 11B8, 0001,203D,0180,09E8,0000,1176
U 11B9, 0018,0038,0980,09F0,0000,12D2
U 12D2, 0818,0038,4180,0800,0000,12D3
U 12D3, 0000,003C,3180,3C00,0000,11BC
U 11BC, 0000,003D,0180,0800,0000,1166
U 11BD, 0000,003C,0180,0800,0000,11C0
:2830
U 11C0, 0818,0339,0980,0800,0000,11A0
U 11C1, 001D,2000,0180,0800,0010,12D4
U 12D4, 0000,013C,0180,0800,0000,11C4
U 11C4, 0001,203D,0180,09E8,0000,1176
U 11C5, 0000,003C,0180,0800,0000,12D6
:2836
U 11A0, 0000,003E,01F8,0800,0000,0001
U 11A1, 0018,003A,05C0,0800,0000,0001
U 11A2, 0018,003A,09C0,0800,0000,0001
U 11A3, 0018,003A,0DC0,0800,0000,0001
U 11A4, 0018,003A,11C0,0800,0000,0001
U 11A5, 0018,0038,11C0,0800,0000,12D5
U 11A6, 0018,003A,D5C0,0800,0000,0001
U 11A7, 0018,003A,5DC0,0800,0000,0001
:2845
U 12D5, 0019,2016,05C0,0800,0000,0001
U 12D6, 0000,003C,0180,0800,0000,11C8

```

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:2848 .PAGE "TEST 9F BRANCH ENABLE 1B -- ALU Z BIT"
:2849 *****
:2850 ++
:2851 TEST 9F BRANCH ENABLE 1B -- ALU Z BIT
:2852
:2853 TEST DESCRIPTION
:2854 THIS TEST CHECKS BIT POSITION 2 OF BRANCH ENABLE 1B.
:2855
:2856 LOGIC DESCRIPTION
:2857 THIS TEST CHECKS THE BRANCH MUX ON THE USC MODULE.
:2858
:2859 ERROR DESCRIPTION
:2860 DATA: EXPECTED BRANCH BITS
:2861 RECEIVED BRANCH BITS
:2862
:2863 SYNC POINT DESCRIPTION
:2864 SYNC07 -- BRANCH BIT IS ASSERTED ON THE UPC
:2865 SYNC08 -- BRANCH BIT IS ASSERTED ON THE UPC
:2866 -
:2867 *****
:2868 =0
:2869 T003: NEWTST[.2]
:2870 RC[OE]_0,D_0 ; SET THE EXPECTED DATA
:2871 ID[CES]_D ; CLEAR THE BRANCH BIT
:2872 =0 ERLOOP
:2873 NOP
:2874 =0
:2875 SYNC07: ALU.Z?,CALL,J/BEN1B,D_0 ; EXECUTE THE BRANCH
:2876 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
:2877 Z?
:2878 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
:2879 RC[OE]_K[.4] ; SET THE EXPECTED DATA
:2880 D_K[.80] ; GENERATE DATA TO SET THE BIT
:2881 D-D.LEFT
:2882 ID[CES]_D ; SET THE BRANCH BIT
:2883 =0 ERLOOP
:2884 NOP
:2885 =0
:2886 SYNC08: ALU.Z?,CALL,J/BEN1B,D_K[.4] ; EXECUTE THE BRANCH
:2887 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
:2888 Z?
:2889 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
:2890 J/ENDT003
:2891 =0011
:2892 BEN1B: Q_0,RETURN1
:2893 Q_K[.4],RETURN1
:2894 Q_K[.8],RETURN1
:2895 Q_K[.C],RETURN1
:2896 ENDT003:NOP
  
```

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U 11C8, 0018,0039,0980,09F8,0000,10BE
U 11C9, 0F03,003C,0180,09F0,0000,12D7
U 12D7, 0000,003C,3180,3C00,0000,11CC
U 11CC, 0000,003D,0180,0800,0000,1166
U 11CD, 0000,003C,0180,0800,0000,11DE
:2874
U 11DE, 0F00,1B3D,0180,0800,0000,11C3
U 11DF, 001D,2000,0180,0800,0010,12D8
U 12D8, 0000,013C,0180,0800,0000,11E0
U 11E0, 0001,203D,0180,09E8,0000,1176
U 11E1, 0018,0038,1180,09F0,0000,12D9
U 12D9, 0818,0038,4180,0800,0000,12DA
U 12DA, 0500,003C,0180,0800,0000,12DB
U 12DB, 0000,003C,3180,3C00,0000,11E2
U 11E2, 0000,003D,0180,0800,0000,1166
U 11E3, 0000,003C,0180,0800,0000,11E4
:2885
U 11E4, 0818,1B39,1180,0800,0000,11C3
U 11E5, 001D,2000,0180,0800,0010,12DC
U 12DC, 0000,013C,0180,0800,0000,11E6
U 11E6, 0001,203D,0180,09E8,0000,1176
U 11E7, 0000,003C,0180,0800,0000,12DD
:2896
U 11C3, 0000,003E,01F8,0800,0000,0001
U 11C7, 0018,003A,11C0,0800,0000,0001
U 11CB, 0018,003A,01C0,0800,0000,0001
U 11CF, 0018,003A,85C0,0800,0000,0001
U 12DD, 0000,003C,0180,0800,0000,11E8
  
```

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:2897 .PAGE 'TEST A0 ID BUS ADDRESSED BY THE SC'
:2898 *****
:2899 ++
:2900 TEST A0 ID BUS ADDRESSED BY THE SC
:2901
:2902 TEST DESCRIPTION
:2903 THIS TEST READS THE ID BUS REGISTERS USING THE KMX FIELD AS THE
:2904 ADDRESS SOURCE AND COMPARES THE DATA READ WITH THE DATA FROM A READ
:2905 OF THE SAME REGISTER WITH THE SC AS THE ADDRESS SOURCE.
:2906 SUBTEST 1 - CHECK THE ADDRESSES FROM 3 TO 7
:2907 SUBTEST 2 - CHECK THE ADDRESSES FROM 09 TO 10
:2908 SUBTEST 3 - CHECK THE ADDRESSES FROM 19 TO 1E
:2909 SUBTEST 4 - CHECK THE ADDRESSES FROM 21 TO 3F
:2910
:2911 LOGIC DESCRIPTION
:2912 THIS TEST CHECKS THE ID BUS ADDRESS MUX ON THE ICL MODULE.
:2913
:2914 ERROR DESCRIPTION
:2915 DATA: EXPECTED ID BUS REGISTER CONTENTS
:2916 RECEIVED ID BUS REGISTER CONTENTS
:2917 ID BUS REGISTER ADDRESS
:2918 LOOP COUNT
:2919 --
:2920 *****
:2921 =0
:2922 T009: NEWTST[.4]
:2923 NOP
:2924 :////////////////////
:2925 +
:2926 CHECK REGISTERS 03 THRU 07
:2927 -
:2928 =0 SUBTEST
:2929 R[0] 0 ; INIT ADDRESS COUNTER
:2930 SC K[.3],R[0C]_K[.3] ; INIT THE SC AND TIMEOUT
:2931 D R[.4]
:2932 R[0B]_D+K[.1] ; SET THE LOOP COUNT
:2933 =0 ERLOOP
:2934 LOOP9: D R[0] ; GET THE BRANCH COUNT
:2935 =0 D3-0? CALL J/IDBUS1 ; READ THE REGISTER WITH THE KMX FIELD
:2936 R[0E] Q ; SAVE DATA
:2937 Q ID(SC),D R[0E] ; READ USING SC AS ADDRESS
:2938 A[U_Q-D,CLK.UBCC] ; CHECK
:2939 Z?
:2940 =0 ERROR2,R[0D]_Q ; SC REFERENCED WRONG REGISTER
:2941 D R[0]
:2942 R[0] D+K[.1],SC_SC+K[.1] ; SELECT NEXT ADDRESS
:2943 D R[0C]
:2944 R[0C] D+K[.1]
:2945 D R[0B]
:2946 R[0B]_D-K[.1],CLK.UBCC ; DECREMENT LOOP COUNT
:2947 Z?
:2948 =0 J/LOOP9
:2949 NOP
:2950 :////////////////////
:2951 +

```

U 11E8, 0018,0039,1180,09F8,0000,10BE
U 11E9, 0000,003C,0180,0800,0000,11EA

U 11EA, 0000,003D,0180,0800,0000,118E
U 11EB, 0003,003C,0180,0A80,0000,12DE
U 12DE, 0018,0038,0D80,09E0,0084,72DF
U 12DF, 0818,0038,1180,0800,0000,12E0
U 12E0, 0019,0014,0580,09D8,0000,11EC
U 11EC, 0000,003D,0180,0800,0000,1166
U 11ED, 0800,003C,0180,0A00,0000,11EE
U 11EE, 0000,193D,0180,0800,0000,11B0
U 11EF, 0001,203C,0180,09F0,0000,12E1
U 12E1, 0810,0038,01F0,2570,0000,12E2
U 12E2, 001D,2000,0180,0800,0010,12E3
U 12E3, 0000,013C,0180,0800,0000,11F0
U 11F0, 0001,203D,0180,09E8,0000,1176
U 11F1, 0800,003C,0180,0A00,0000,12E4
U 12E4, 0019,0014,0580,0A80,0084,92E5
U 12E5, 0810,0038,0180,0960,0000,12E6
U 12E6, 0019,0014,0580,09E0,0000,12E7
U 12E7, 0810,0038,0180,0958,0000,12E8
U 12E8, 0019,0000,0580,09D8,0010,12E9
U 12E9, 0000,013C,0180,0800,0000,11F2
U 11F2, 0000,003C,0180,0800,0000,11ED
U 11F3, 0000,003C,0180,0800,0000,11F4


```

:2952 ; CHECK REGISTERS 9 THRU 10
:2953 :-
U 11F4, 0000,003D,0180,0800,0000,118E :2954 =0 SUBTEST
U 11F5, 0003,003C,0180,0A80,0000,12EA :2955 R[0]_0 ; INIT BRANCH DATA
U 12EA, 0018,0038,0980,09E0,0084,72EB :2956 SC_K[.9],RC[0C]_K[.9] ; INIT THE SC
U 12EB, 0018,0038,0180,09D8,0000,11F6 :2957 RC[0B]_K[.8] ; SET THE LOOP COUNT
U 11F6, 0000,003D,0180,0800,0000,1166 :2958 ERLOOP
U 11F7, 0800,003C,0180,0A00,0000,11F8 :2959 LOOP9A: D R[0] ; GET BRANCH INDEX
U 11F8, 0000,193D,0180,0800,0000,11D0 :2960 =0 D3-0?,CALL,J/IDBUS2 ; READ THE REGISTER WITH THE KMX FIELD
U 11F9, 0001,203C,0180,09F0,0000,12EC :2961 RC[0E]_Q
U 12EC, 0810,0038,01F0,2570,0000,12ED :2962 Q_ID(SC),D RC[0E] ; READ WITH THE SC
U 12ED, 001D,2000,0180,0800,0010,12EE :2963 ACU_Q-D,CLR.UBCC ; CHECK
U 12EE, 0000,013C,0180,0800,0000,11FA :2964 Z?
U 11FA, 0001,203D,0180,09E8,0000,1176 :2965 =0 ERROR2,RC[0D]_Q ; SC ADDRESSED WRONG REGISTER
U 11FB, 0800,003C,0180,0A00,0000,12EF :2966 D R[0]
U 12EF, 0019,0014,0580,0A80,0000,12F0 :2967 R[0] D+K[.1] ; INCREMENT BRANCH INDEX
U 12F0, 0810,0038,0180,0960,0000,12F1 :2968 D RC[0C]
U 12F1, 0019,0014,0580,09E0,0084,92F2 :2969 RC[0C] D+K[.1],SC_SC+K[.1] ; SELECT NEXT ADDRESS
U 12F2, 0810,0038,0180,0958,0000,12F3 :2970 D RC[0B]
U 12F3, 0019,0000,0580,09D8,0010,12F4 :2971 RC[0B]_D-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 12F4, 0000,013C,0180,0800,0000,11FC :2972 Z?
U 11FC, 0000,003C,0180,0800,0000,11F7 :2973 =0 J/LOOP9A
U 11FD, 0000,003C,0180,0800,0000,11FE :2974 NOP
:2975 ;////////////////////
:2976 ;+
:2977 ; CHECK REGISTERS 19 THRU 1E
:2978 :-
U 11FE, 0000,003D,0180,0800,0000,118E :2979 =0 SUBTEST
U 11FF, 0003,003C,0180,0A80,0000,12F5 :2980 R[0]_0
U 12F5, 0818,0038,07D8,0800,0000,12F6 :2981 D K[.18]
U 12F6, 0019,0014,0580,09E0,0082,12F7 :2982 ACU D+K[.1],SC_ALU,RC[0C]_ALU ; INIT THE SC ADDRESS
U 12F7, 0018,0038,0580,09D8,0000,1200 :2983 RC[0B]_K[.6] ; SET THE LOOP COUNT
U 1200, 0000,003D,0180,0800,0000,1166 :2984 =0 ERLOOP
U 1201, 0800,003C,0180,0A00,0000,1202 :2985 LOOP9B: D R[0] ; GET THE BRANCH INDEX
U 1202, 0000,193D,0180,0800,0000,11D8 :2986 =0 D3-0?,CALL,J/IDBUS3 ; READ, USING THE KMX FIELD
U 1203, 0001,203C,0180,09F0,0000,12F8 :2987 RC[0E]_Q
U 12F8, 0810,0038,01F0,2570,0000,12F9 :2988 Q_ID(SC),D RC[0E] ; READ, USING SC
U 12F9, 001D,2000,0180,0800,0010,12FA :2989 ACU_Q-D,CLR.UBCC ; CHECK
U 12FA, 0000,013C,0180,0800,0000,1204 :2990 Z?
U 1204, 0001,203D,0180,09E8,0000,1176 :2991 =0 ERROR2,RC[0D]_Q ; SC ADDRESSED WRONG REGISTER
U 1205, 0800,003C,0180,0A00,0000,12FB :2992 D R[0]
U 12FB, 0019,0014,0580,0A80,0000,12FC :2993 R[0] D+K[.1]
U 12FC, 0810,0038,0180,0960,0000,12FD :2994 D RC[0C]
U 12FD, 0019,0014,0580,09E0,0084,92FE :2995 RC[0C] D+K[.1],SC_SC+K[.1]
U 12FE, 0810,0038,0180,0958,0000,12FF :2996 D RC[0B]
U 12FF, 0019,0000,0580,09D8,0010,1300 :2997 RC[0B]_D-K[.1],CLK.UBCC
U 1300, 0000,013C,0180,0800,0000,1206 :2998 Z?
U 1206, 0000,003C,0180,0800,0000,1201 :2999 =0 J/LOOP9B
U 1207, 0000,003C,0180,0800,0000,1208 :3000 NOP
:3001 ;////////////////////
:3002 ;+
:3003 ; CHECK ADDRESSES 21 THRU 23
:3004 :-
U 1208, 0000,003D,0180,0800,0000,118E :3005 =0 SUBTEST
U 1209, 0003,003C,0180,0A80,0000,1301 :3006 R[0]_0

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U 1301, 0818,0038,7580,0800,0000,1302 :3007      D K[.20]
U 1302, 0019,0014,0580,09E0,0082,1303 :3008      RC[OC] D+K[.1],SC_ALU
U 1303, 0018,0038,0D80,09D8,0000,120A :3009      RC[OB]_K[.3]
U 120A, 0000,003D,0180,0800,0000,1166 :3010      =0      ERLOOP
U 120B, 0800,003C,0180,0A00,0000,120C :3011      LOOP9C: D R[0]
U 120C, 0000,193D,0180,0800,0000,1038 :3012      =0      D3-0?,CALL,J/IDBUS4
U 120D, 0001,203C,0180,09F0,0000,1304 :3013      RC[OE] Q
U 1304, 0810,0038,01F0,2570,0000,1305 :3014      Q_ID(SC),D RC[OE]
U 1305, 001D,2000,0180,0800,0010,1306 :3015      A[U_Q-D,CLR.UBCC
U 1306, 0000,013C,0180,0800,0000,120E :3016      Z?
U 120E, 0001,203D,0180,09E8,0000,1176 :3017      =0      ERROR2,RC[OD]_Q
U 120F, 0800,003C,0180,0A00,0000,1307 :3018      D R[0]
U 1307, 0019,0014,0580,0A80,0000,1308 :3019      R[0] D+K[.1]
U 1308, 0810,0038,0180,0960,0000,1309 :3020      D RC[OC]
U 1309, 0019,0014,0580,09E0,0084,930A :3021      RC[OC] D+K[.1],SC_SC+K[.1]
U 130A, 0810,0038,0180,0958,0000,130B :3022      D RC[OB]
U 130B, 0019,0000,0580,09D8,0010,130C :3023      RC[OB]_D-K[.1],CLK.UBCC
U 130C, 0000,013C,0180,0800,0000,1210 :3024      Z?
U 1210, 0000,003C,0180,0800,0000,120B :3025      =0      J/LOOP9C
U 1211, 0000,003C,0180,0800,0000,130D :3026      J/END009
:3027      =000
U 11B0, 0000,003E,0DF0,2C00,0000,0001 :3028      IDBUS1: Q_ID[SYS.ID],RETURN1
U 11B1, 0000,003E,11F0,2C00,0000,0001 :3029      Q_ID[RXC],RETURN1
U 11B2, 0000,003E,15F0,2C00,0000,0001 :3030      Q_ID[RXDB],RETURN1
U 11B3, 0000,003E,19F0,2C00,0000,0001 :3031      Q_ID[TXC],RETURN1
U 11B4, 0000,003E,1DF0,2C00,0000,0001 :3032      Q_ID[TXDB],RETURN1
:3033      =
:3034      =000
U 11D0, 0000,003E,25F0,2C00,0000,0001 :3035      IDBUS2: Q_ID[NXT.PER],RETURN1
U 11D1, 0000,003E,29F0,2C00,0000,0001 :3036      Q_ID[CLK.CS],RETURN1
U 11D2, 0000,003E,2DF0,2C00,0000,0001 :3037      Q_ID[INTERVAL],RETURN1
U 11D3, 0000,003E,31F0,2C00,0000,0001 :3038      Q_ID[CES],RETURN1
U 11D4, 0000,003E,35F0,2C00,0000,0001 :3039      Q_ID[VECTOR],RETURN1
U 11D5, 0000,003E,39F0,2C00,0000,0001 :3040      Q_ID[SIR],RETURN1
U 11D6, 0000,003E,3DF0,2C00,0000,0001 :3041      Q_ID[PSL],RETURN1
U 11D7, 0000,003E,41F0,2C00,0000,0001 :3042      Q_ID[TBUF],RETURN1
:3043      =000
U 11D8, 0000,003E,65F0,2C00,0000,0001 :3044      IDBUS3: Q_ID[SBI.ERR],RETURN1
U 11D9, 0000,003E,69F0,2C00,0000,0001 :3045      Q_ID[TIME.ADDR],RETURN1
U 11DA, 0000,003E,6DF0,2C00,0000,0001 :3046      Q_ID[FAULT],RETURN1
U 11DB, 0000,003E,71F0,2C00,0000,0001 :3047      Q_ID[COMP],RETURN1
U 11DC, 0000,003E,75F0,2C00,0000,0001 :3048      Q_ID[MAINT],RETURN1
U 11DD, 0000,003E,79F0,2C00,0000,0001 :3049      Q_ID[PARITY],RETURN1
:3050      =
:3051      =00
U 1038, 0000,003E,85F0,2C00,0000,0001 :3052      IDBUS4: Q_ID[UBREAK],RETURN1
U 1039, 0000,003E,89F0,2C00,0000,0001 :3053      Q_ID[WCS.ADDR],RETURN1
U 103A, 0000,003E,8DF0,2C00,0000,0001 :3054      Q_ID[WCS.DATA],RETURN1
:3055      =
U 130D, 0000,003C,0180,0800,0000,130E :3056      END009: NOP
U 130E, 0000,003D,0180,0800,0000,10BE :3057      ENDTST: NEWTST

```

; Location / Line Number Index

;Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- 0FFF	Unused						
U 1000	1871=	1838	2252=	2253=	1845=	1861=	2254=	2255=
U 1008	2163=	2164=	2165=	2166=	1862=	1863=	2224=	2225=
U 1010	1971=	1972=	2261=	2262=	1974=	1975=	2263=	2264=
U 1018	2196=	2197=	2198=	2199=	2017=	2018=	2229=	2230=
U 1020	2021=	2022=	2270=	2271=	2033=	2034=	2272=	2273=
U 1028	2700=	2701=	2703=	2704=	2119=	2120=	1839	2505=
U 1030	2122=	2123=	2279=	2280=	2125=	2126=	2281=	2282=
U 1038	3052=	3053=	3054=	1840	2130=	2131=	1841	2506=
U 1040	2133=	2134=	2136=	2137=	2302=	2303=	2304=	2305=
U 1048	2154=	2155=	2157=	2158=	2167=	2168=	1902=	2509=
U 1050	2185=	2186=	2189=	2190=	2311=	2312=	2313=	2314=
U 1058	2203=	2204=	1905=	1842	2220=	2221=	1908=	2510=
U 1060	1952=	1953=	1954=	1955=	1956=	1957=	1958=	1959=
U 1068	1960=	1961=	1962=	1963=	1964=	1965=	1966=	1967=
U 1070	2246=	2247=	2248=	2249=	2320=	2321=	2322=	2323=
U 1078	2257=	2258=	2266=	2267=	1843	2578=	1844	2579=
U 1080	2000=	2001=	2002=	2003=	2004=	2005=	2006=	2007=
U 1088	2008=	2009=	2010=	2011=	2012=	2013=	2014=	2015=
U 1090	2275=	2276=	2298=	2299=	2329=	2330=	2331=	2332=
U 1098	2307=	2308=	2316=	2317=	1864	2585=	1865	2586=
U 10A0	2045=	2046=	2047=	2048=	2049=	2050=	2051=	2052=
U 10A8	2053=	2054=	2055=	2056=	2057=	2058=	2059=	2060=
U 10B0	1866	2362=	1867	2363=	1868	2364=	1869	2365=
U 10B8	2325=	2326=	2352=	2353=	1870	2593=	1880	2594=
U 10C0	2063=	2064=	2065=	2066=	2067=	2068=	2069=	2070=
U 10C8	2071=	2072=	2073=	2074=	2075=	2076=	2077=	2078=
U 10D0	1881	2375=	1882	2376=	1883	2377=	1884	2378=
U 10D8	2354=	2355=	1885	2739=	2359=	2360=	1886	2740=
U 10E0	2082=	2083=	2084=	2085=	2086=	2087=	2088=	2089=
U 10E8	2090=	2091=	2092=	2093=	2094=	2095=	2096=	2097=
U 10F0	1887	2389=	1888	2390=	1889	2391=	1890	2392=
U 10F8	2369=	2370=	1891	2744=	2372=	2373=	1892	2745=
U 1100	1825=	1826=	1827=	1828=	1829=	1830=	1831=	1832=
U 1108	1833=	1893	2382=	2383=	1834=	1835=	1836=	1837=
U 1110	2386=	2387=	2446=	2447=	2396=	2397=	2448=	2449=
U 1118	2421=	2422=	1894	2750=	2424=	2425=	1895	2751=
U 1120	2100=	2101=	2102=	2103=	2104=	2105=	2106=	2107=
U 1128	2108=	2109=	2110=	2111=	2112=	2113=	2114=	2115=
U 1130	2426=	2427=	2453=	2454=	2432=	2433=	2455=	2456=
U 1138	2437=	2438=	2441=	2442=	2459=	2460=	2775=	2776=
U 1140	2477=	2478=	2492=	2493=	2499=	2500=	1896	2537=
U 1148	2502=	2504=	2513=	2514=	2532=	2533=	1897	2538=
U 1150	2540=	2541=	2548=	2549=	1898	1928=	2496=	2497=
U 1158	2573=	2574=	2580=	2581=	2588=	2589=	2782=	2783=
U 1160	2621=	2622=	2623=	2624=	2629=	2630=	1899	2545=
U 1168	2634=	2635=	2640=	2641=	2648=	2649=	1900	2546=
U 1170	2651=	2652=	2658=	2659=	1901	2709=	1903	2710=
U 1178	2660=	2661=	2667=	2668=	2690=	2691=	2790=	2791=
U 1180	2692=	2693=	2707=	2708=	2715=	2716=	1904	2553=
U 1188	2734=	2735=	2736=	2737=	2741=	2742=	1936	2554=
U 1190	2747=	2748=	2770=	2771=	1937	2712=	1943	2713=
U 1198	2777=	2778=	1944	2626=	2785=	2786=	1945	2627=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2837=	2838=	2839=	2840=	2841=	2842=	2843=	2844=
U 11A8	2815=	2816=	1947	2632=	2818=	2819=	1948	2633=
U 11B0	3028=	3029=	3030=	3031=	3032=	1949	2821=	2822=
U 11B8	2824=	2825=	1950	2637=	2828=	2829=	1968	2638=
U 11C0	2831=	2832=	1969	2892=	2834=	2835=	1973	2893=
U 11C8	2869=	2870=	1976	2894=	2872=	2873=	1977	2895=
U 11D0	3035=	3036=	3037=	3038=	3039=	3040=	3041=	3042=
U 11D8	3044=	3045=	3046=	3047=	3048=	3049=	2875=	2876=
U 11E0	2878=	2879=	2883=	2884=	2886=	2887=	2889=	2890=
U 11E8	2922=	2923=	2928=	2929=	2933=	2934=	2935=	2936=
U 11F0	2940=	2941=	2948=	2949=	2954=	2955=	2958=	2959=
U 11F8	2960=	2961=	2965=	2966=	2973=	2974=	2979=	2980=
U 1200	2984=	2985=	2986=	2987=	2991=	2992=	2999=	3000=
U 1208	3005=	3006=	3010=	3011=	3012=	3013=	3017=	3018=
U 1210	3025=	3026=	1978	1979	1980	1981	1982	1983
U 1218	1984	1985	1986	1987	1988	1989	1990	1991
U 1220	1992	1993	1994	1995	2016	2023	2024	2025
U 1228	2026	2027	2028	2029	2030	2035	2036	2037
U 1230	2038	2039	2040	2041	2042	2124	2135	2156
U 1238	2159	2160	2161	2162	2187	2188	2191	2192
U 1240	2193	2194	2195	2200	2201	2202	2222	2223
U 1248	2226	2227	2228	2250	2251	2259	2260	2268
U 1250	2269	2277	2278	2300	2301	2309	2310	2318
U 1258	2319	2327	2328	2356	2357	2361	2366	2367
U 1260	2368	2374	2379	2380	2381	2384	2388	2393
U 1268	2394	2395	2423	2428	2429	2430	2431	2434
U 1270	2435	2436	2439	2440	2444	2445	2451	2452
U 1278	2457	2458	2479	2480	2481	2482	2483	2484
U 1280	2485	2486	2487	2488	2489	2490	2491	2494
U 1288	2495	2498	2501	2508	2511	2512	2534	2535
U 1290	2536	2542	2543	2544	2550	2551	2552	2555
U 1298	2575	2576	2577	2582	2583	2584	2590	2591
U 12A0	2592	2595	2596	2625	2631	2636	2639	2642
U 12A8	2643	2644	1929:	2645	2646	2647	2653	2654
U 12B0	2655	2656	2657	2662	2663	2664	2665	2666
U 12B8	2669	2694	2695	2696	2697	2698	2699	2705
U 12C0	2706	2711	2714	2738	2743	2749	2772	2773
U 12C8	2774	2779	2780	2781	2787	2788	2789	2792
U 12D0	2817	2823	2826	2827	2833	2846	2847	2871
U 12D8	2877	2880	2881	2882	2888	2896	2930	2931
U 12E0	2932	2937	2938	2939	2942	2943	2944	2945
U 12E8	2946	2947	2956	2957	2962	2963	2964	2967
U 12F0	2968	2969	2970	2971	2972	2981	2982	2983
U 12F8	2988	2989	2990	2993	2994	2995	2996	2997
U 1300	2998	3007	3008	3009	3014	3015	3016	3019
U 1308	3020	3021	3022	3023	3024	3056	3057	
U 1310	- 13EF Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

ZZ-ESKAH-V132 Line Number Index
ESKAH26.MCR

MICRO2 1M(01)

16-DEC-82 11:03:36

B 13

SEQ 0359
Page 8

Words not
in bounds

ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH26	799

Used 799
Remaining

Total microwords used in memory U: 799
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)


```
: The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH26.MIC
```

```
Pass 1 warnings:    0    Pass 2 warnings:    0
Pass 1 errors:      0    Pass 2 errors:      0
```

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2231	TEST A1 VAMX/VA, PAMX/VAMX, PA BUS AND TIME.OUT.ADDR REG TEST
: 2338	TEST A2 VAMX IN COMPATIBILITY MODE TEST
: 2448	TEST A3 MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX
: 2491	TEST A4 TB WRITE PULSE LOGIC TEST
: 3232	TEST A5 DATA PATH TO AND FROM DATA MEMORY TEST

ZZ-ESKAH-V132 Subroutines
ESKAH27.MCR

MICRO2 1M(01) 16-DEC-82 11:05:17

E 13

SEQ 0362
Page

:1
:1804 .NOLIST
:1805 .LIST

ZZ-ESKAH-V132 Subroutines
ESKAH27.MCR
MICRO2 1M(01) 16-DEC-82 11:05:17
E 13
SEQ 0362
Page
:1
:1804 .NOLIST
:1805 .LIST

1806 .TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
1807 .REGION/1000,13FF
1808 +

1809 : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
1810 : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
1811 : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
1812 : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
1813 : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

1814 :
1815 : FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
1816 : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
1817 : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
1818 : R[OF] AND DO A RETURN0.
1819 :

1820 : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
1821 : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
1822 : TO THE CONSOLE.
1823 :
1824 : -

1825	1100:	SC_K[ZERO],J/TRPH1	:	SYSTEM INIT
1826	1101:	SC_K[.1],J/TRPH0	:	DATA UNALIGNED
1827	1102:	SC_K[.2],J/TRPH0	:	X PAGE ERROR
1828	1103:	SC_K[.3],J/TRPH0	:	TB MODIFY
1829	1104:	SC_K[.4],J/TRPH0	:	TB PROT ERROR
1830	1105:	SC_K[.6],J/TRPH0	:	TB MISS
1831	1106:	SC_K[.9],J/TRPH0	:	RES FLOAT OPER
1832	1107:	SC_K[.7],J/TRPH0	:	TB PARITY
1833	1108:	SC_K[.8],J/TRPH0	:	CACHE PARITY
1834	110C:	SC_K[.C],J/TRPH1	:	RDS
1835	110D:	SC_K[.D],J/TRPH1	:	TIME OUT
1836	110E:	SC_K[.10],J/TRPH0	:	ODD ADDRESS
1837	110F:	SC_K[.F],J/TRPH1	:	CS PARITY
1838	TRPH0:	Q_ID[USTACK]		
1839		Q_D.D.Q		
1840		ID[USTACK]_D		
1841		Q_D.D.Q		
1842		Q-R[OF]		
1843		ALU_Q.ANDNOT.MASK,CLK.UBCC	:	WAS TRAP EXPECTED?
1844		Z?	:	BRANCH IF NO
1845	=0	ALU_Q.AND.MASK,R[OF]_ALU,RETURN0	:	CLEAR THE BIT AND RETURN

1846 : +
1847 : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
1848 : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
1849 : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

1850 :
1851 : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
1852 : TRAP CODE--INDICATES WHICH TRAP OCCURRED
1853 : FAULT STATUS REGISTER
1854 : SBI ERROR REGISTER
1855 : TIMEOUT ADDRESS REGISTER
1856 : MAINTENANCE REGISTER
1857 : CACHE PARITY REGISTER
1858 : TB ERROR REGISTER 1
1859 : TB ERROR REGISTER 0
1860 : -

U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,1006
U 1006, 0C00,003C,01E0,0800,0000,100E
U 100E, 0000,003C,8180,3C00,0000,1016
U 1016, 0C00,003C,01E0,0800,0000,101E
U 101E, 0000,003C,01C0,0A78,0000,1026
U 1026, 0001,2024,0180,0800,0010,102E
U 102E, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,721F :1862
U 1005, 0000,003C,49F0,2C00,0000,1036 :1863
U 1036, 0001,203C,4DF0,2DB0,0000,103E :1864
U 103E, 0001,203C,65F0,2DB8,0000,1046 :1865
U 1046, 0001,203C,6DF0,2DD8,0000,1056 :1866
U 1056, 0001,203C,75F0,2DE0,0000,105B :1867
U 105B, 0001,203C,79F0,2DC8,0000,1066 :1868
U 1066, 0001,203C,69F0,2DC0,0000,106E :1869
U 106E, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1219 :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWTST
ERLOOP
ERROR1
ERROR2

U 1076, 0000,003C,65F8,0800,0084,707E :1880
U 107E, 0818,0038,8D80,0800,0000,1109 :1881
U 1109, 0D00,003C,0180,0800,0000,1154 :1882
U 1154, 0000,003C,3D80,3C00,0000,1209 :1883
U 1209, 0818,0038,0580,0800,0000,120A :1884
U 120A, 0D00,003C,0180,0800,0000,120B :1885
U 120B, 0F00,003C,3180,3C00,0000,120C :1886
U 120C, 0000,003C,5D80,3C00,0000,120D :1887
U 120D, 0000,003C,3980,3C00,0000,120E :1888
U 120E, 0000,003C,2980,3C00,0000,120F :1889
U 120F, 0000,003C,4980,3C00,0000,1210 :1890
U 1210, 0818,0038,C180,0800,0000,1211 :1891
U 1211, 0000,003C,6580,3C00,0000,1212 :1892
U 1212, 0F00,003C,6D80,3C00,0000,1213 :1893
U 1213, 0000,003C,6D80,3C00,0000,1214 :1894
U 1214, 0000,003C,6580,3C00,0000,1215 :1895
U 1215, 0003,003C,0180,09F0,0000,1216 :1896
U 1216, 0003,003C,0180,0AF8,0000,1217 :1897
U 1217, 0003,003C,0180,09E8,0000,105E :1898
U 1218, 0818,0038,0980,0800,0000,105E :1899
U 1219, 0810,0038,0180,0978,0000,121A :1900
U 121A, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 121B, 0810,0038,0180,0978,0000,121C :1903
U 121C, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905

SCOPE: SC K[.10],Q_0

; SETUP TO WRITE IPL OF 1F
; ...

; WRITE THE PSL
; SETUP TO CLEAR THE CES REGISTER

; CLEAR THE CES REGISTER
; SHUT OFF THE FLOATING POINT
; CLEAR THE SIR REGISTER
; STOP INTERVAL TIMER
; SHUT OFF THE TB

ERLOOP: D_K[.2],J/CALLCON

; CALL THE CONSOLE
; ERRLOOP CALL

ERROR1: D_RC[0F]

D_D.AND.K[.FF00]

104E: D_D.OR.K[.4],J/CALLCON

ERROR2: D_RC[0F]

D_D.AND.K[.FF00]

105A: D_D.OR.K[.6],J/CALLCON

105E:

CALLCON:

ID[TXDB]_D,J/CALLCON

; CALL THE CONSOLE

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,121D :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 121D, 0810,0038,4D80,0978,0000,121E :1936
U 121E, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 121F, 0010,0038,01C0,0978,0000,1220 :1943
U 1220, 0019,2034,4DC0,0800,0000,1221 :1944
U 1221, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
:1948
:1949
U 1222, 0F18,0038,C1F8,0800,0000,100C :1950
U 100C, 0500,003D,0380,0800,0000,1266 :1951
U 100D, 0000,003C,8580,0800,0084,7223 :1952
U 1223, 0D00,003C,0180,0800,0000,1224 :1953
U 1224, 0000,003E,7580,3C00,0000,0001 :1954
:1955
:1956
U 1225, 0818,0038,0DF8,0800,0000,1226 :1957
U 1226, 0000,003C,6180,0800,0084,7227 :1958
U 1227, 0D00,003C,0180,0800,0000,1228 :1959
U 1228, 0000,003E,7580,3C00,0000,0001 :1960
:1961
:1962
U 1229, 0000,003C,8580,0800,0084,722A :1963
U 122A, 0803,001C,0180,0800,0000,122B :1964
U 122B, 0000,003E,7580,3C00,0000,0001 :1965
:1966
:1967
:1968
:1969
U 1014, 0000,003D,0180,0800,0000,126A :1970

```

```

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP
:
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:
SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1
:
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:
SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1
: THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
: AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
: UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
: ARE LOST.
CSOFF: D Q,Q,ALU,K[.FFFF]
=0 D-D.LEFT,S177,CALL,J/DC9
SC K[C]
D DAL,SC
ID[MAINT],D,RETURN1
: THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
: BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
COFF: D K[3],Q-Q
SC K[F]
D DAL,SC
ID[MAINT],D,RETURN1
: THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
: APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
SOFF: SC K[C]
ALD NOT,MASK,D,ALU
ID[MAINT],D,RETURN1
: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.
=0
DC.DE: CALL,J/DCD

```

```
U 1015, 0000,003C,0180,0800,0000,101C :1971
U 101C, 0000,003D,0180,0800,0000,126B :1972
U 101D, 0000,003E,0180,0800,0000,0001 :1973
:1974
:1975 : THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
:1976 : IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
:1977 : VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
:1978 : MME WILL BE SET HERE. UPON RETURN THE CONTENTS
:1979 : OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
:1980 : D AND Q ARE LOST.
:1981 : THIS ROUTINE WRITES GROUP 1
:1982
:1983
:1984
:1985
:1986
:1987
:1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
:1998
:1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
:2007
:2008
:2009
:2010
:2011
:2012
:2013
:2014
:2015
:2016
:2017
:2018
:2019
:2020
:2021
:2022
:2023
:2024
:2025

NOP
=0 CALL,J/DCE
RETURN1
: THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
: IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
: VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
: MME WILL BE SET HERE. UPON RETURN THE CONTENTS
: OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
: D AND Q ARE LOST.
: THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DCB
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWA: ID[TBER0] D,D_R[8]
ID[TBUF] 0
Q ID[TBER1],RETURN1
: ROUTINE TO WRITE GROUP 0
=0
TBWR0: D_0,CALL,J/DC4
J7TBWR
: ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DCB
D_D.LEFT,SI/ZERO,J/TBWR
: THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D K[1],J/TBWA
: THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
: THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
: R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
: TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
: R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC K[9],LAB_R[5]
=0 ACU_MASK+1,Q,ALU,CALL,J/DC0
ALU_LA[ANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
: THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
: TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
: RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
: AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
: INDICATED IN R[E].
RELCHK: LAB R[0E]
=0 ERL0OP
R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERENCE
Q ID[TIME.ADDR],D_R[0F]
ACU_0(K),R[0F],_ALD
LAB_R[0E]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?
```



```

U 1050. 0001,003C,0180,09C8,0000,1240 :2026
U 1051. 0000,003C,0180,0800,0000,1052 :2027
U 1052. 0F00,003D,0180,0800,0000,126B :2028
U 1053. 0500,003C,0180,0800,0000,1238 :2029
U 1238. 0001,003C,0180,0800,0082,1239 :2030
U 1239. 0803,0010,0180,0800,0000,123A :2031
U 123A. 001D,2024,01C0,0800,0000,123B :2032
U 123B. 0800,003C,0180,0A38,0000,123C :2033
U 123C. 0001,003C,0180,09E0,0000,123D :2034
U 123D. 0001,203C,0180,09D8,0000,123E :2035
U 123E. 001D,2000,0180,0800,0010,123F :2036
U 123F. 0000,013C,0180,0800,0000,1054 :2037
U 1054. 0000,003E,0180,0800,0000,0002 :2038
U 1055. 0000,003E,0180,0800,0000,0003 :2039
U 1240. 0000,003C,4DF0,2C00,0000,1241 :2040
U 1241. 0001,203E,0180,09F0,0000,0001 :2041

U 1242. 0000,003C,0180,0A70,0000,1058 :2046
U 1058. 0000,003D,0180,0800,0000,1218 :2047
U 1059. 0000,003C,0180,52F8,0000,1243 :2048
U 1243. 0800,003C,0180,0A78,0000,1244 :2049
U 1244. 0018,0038,1980,0AF8,0000,1245 :2050
U 1245. 0000,003C,0180,0A70,0000,1246 :2051
U 1246. 0001,003C,0180,09C8,0000,1247 :2052
U 1247. 001C,2000,0180,0800,0010,1248 :2053
U 1248. 0000,013C,0180,0800,0000,105C :2054
U 105C. 0000,003C,0180,0800,0000,1249 :2055
U 105D. 0000,003E,0180,0800,0000,0001 :2056
U 1249. 0000,003C,D580,0800,0084,724A :2057
U 124A. 0001,0024,0180,0800,0010,124B :2058
U 124B. 0000,013C,4DF0,2C00,0000,1060 :2059
U 1060. 0001,203E,0180,09F0,0000,0002 :2060
U 1061. 0000,003E,0180,0800,0000,0003 :2061

U 124C. 0000,003C,D580,0A70,0084,7062 :2068
U 1062. 0000,003D,0180,0800,0000,1218 :2070
U 1063. 0000,003C,0180,52F8,0000,124D :2071
U 124D. 0800,003C,49F0,2E78,0000,124E :2072
U 124E. 0018,0038,1980,0AF8,0000,124F :2073
U 124F. 0001,203C,0180,09E8,0000,1250 :2074
U 1250. 0003,001C,0180,09F0,0000,1251 :2075
U 1251. 0000,003C,0180,0A70,0000,1252 :2076
U 1252. 001C,2000,0180,0800,0010,1253 :2077
U 1253. 0001,013C,0180,09C8,0000,1064 :2078
U 1064. 0000,003C,0180,0800,0000,1255 :2079
U 1065. 0001,2024,0180,0800,0010,1254 :2080

```

```

=0 RC[9]_D,J/TBTRUE ; TRAPPED SO RETURN1.
NOP
=0 D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
D_D,LEFT,S1/ZERO
SC_D
ALD_MASK+1,D_ALU
ALU_Q[ANDNOT]D,Q_ALU
D_R[7] ; SEE IF ADDRESS RELOCATED
RC[0C]_D
RC[0B]_Q
ALU_Q-D,CLK.UBCC ; PROPERLY.
Z?
=0 RETURN2 ; INCORRECT.
RETURN3 ; OK
TBTRUE: Q_ID[TBER1]
RC[0E]_Q,RETURN1
; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
; IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
MISS: LAB_RC[0E]
=0 ERLOOP
RC[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
D_RC[0F]
ALU_Q(K),RC[0F]_ALU
LAB_RC[0E]
RC[9]_D
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?
=0 J/MISSA
RETURN1 ; NO TRAP SO RETURN1.
MISSA: SC_K[.6] ; IF A TRAP OCCURRED SEE
ALD_D,ANDNOT.MASK,CLK.UBCC ; IF IT WAS A TB MISS TRAP.
Z?,Q_ID[TBER1]
=0 RETURN2,RC[0E]_Q ; NOT TB MISS.
RETURN3 ; TB MISS.
; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
; HIT/MISS BIT IN TBER0 IS INCORRECT.
; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
; CHECK HIT IN GROUP 0.
HITO: LAB_RC[0E],SC_K[.6]
=0
HIT: ERLOOP
RC[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
Q_ID[TBER0],D_RC[0F]
ALU_Q(K),RC[0F]_ALU
RC[0D]_Q
RC[0E]_ALU,ALU_NOT.MASK
LAB_RC[0E]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF TRAP OCCURRED.
Z?,RC[9]_D
=0 J/HITA ; TRAP OCCURRED.
ALU_Q,ANDNOT.MASK,CLK.UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?

```



```
U 1254, 0000,013C,0180,0800,0000,1068 :2081
U 1068, 0000,003E,0180,0800,0000,0004 :2082
U 1069, 0000,003E,0180,0800,0000,0003 :2083
U 1255, 0000,003C,D580,0800,0084,7256 :2084
U 1256, 0001,0024,0180,0800,0010,1257 :2085
U 1257, 0000,013C,0180,0800,0000,106A :2086
U 106A, 0000,003C,0180,0800,0000,1240 :2087
U 106B, 0000,003E,0180,0800,0000,0002 :2088
:2089
U 1258, 0000,003C,5D80,0A70,0084,7062 :2090
:2091
U 1259, 0118,0038,1B80,0800,0000,126D :2092
U 125A, 0118,0038,0B80,0800,0000,126D :2093
U 125B, 0118,0038,0780,0800,0000,126D :2094
U 125C, 0118,0038,C380,0800,0000,126D :2095
U 125D, 0018,0038,1980,0800,0000,1259 :2096
U 125E, 0018,0038,1980,0800,0000,125A :2097
U 125F, 0018,0038,1980,0800,0000,125B :2098
U 1260, 0018,0038,1980,0800,0000,125C :2099
U 1261, 0018,0038,0980,0800,0000,1259 :2100
U 1262, 0018,0038,0980,0800,0000,125A :2101
U 1263, 0018,0038,0980,0800,0000,125B :2102
U 1264, 0018,0038,0980,0800,0000,125C :2103
U 1265, 0018,0038,0580,0800,0000,1259 :2104
U 1266, 0018,0038,0580,0800,0000,125A :2105
U 1267, 0018,0038,0580,0800,0000,125B :2106
U 1268, 0018,0038,0580,0800,0000,125C :2107
U 1269, 0018,0038,C180,0800,0000,1259 :2108
U 126A, 0018,0038,C180,0800,0000,125A :2109
U 126B, 0018,0038,C180,0800,0000,125B :2110
U 126C, 0018,0038,C180,0800,0000,125C :2111
U 126D, 0100,003E,0380,0800,0000,0001 :2112
U 126E, 0018,0038,01C0,0800,0000,106C :2113
:2114
U 106C, 0000,003D,0180,0800,0000,1262 :2115
U 106D, 0019,2000,05C0,0800,0010,126F :2116
U 126F, 0000,013C,0180,0800,0000,1070 :2117
U 1070, 0000,003C,0180,0800,0000,106C :2118
U 1071, 0000,003E,0180,0800,0000,0001 :2119
:2120
U 1072, 0000,003D,0180,0800,0000,126E :2121
U 1073, 0500,003E,0180,0800,0000,0001 :2122
U 1270, 0018,0038,01C0,0800,0000,1074 :2123
:2124
U 1074, 0000,003D,0180,0800,0000,1266 :2125
U 1075, 0019,2000,05C0,0800,0010,1271 :2126
U 1271, 0000,013C,0180,0800,0000,1078 :2127
U 1078, 0000,003C,0180,0800,0000,1074 :2128
U 1079, 0000,003E,0180,0800,0000,0001 :2129
:2130
U 107A, 0000,003D,0180,0800,0000,1270 :2131
U 107B, 0018,0038,C180,0800,0000,1272 :2132
U 1272, 0600,003E,0380,0800,0000,0001 :2133
:2134
U 107C, 0000,003D,0180,0800,0000,1270 :2135
```

```

Z?
=0 RETURN4
RETURN3
HITA: SC K[.6]
ALU_D.ANDNOT.MASK,CLK.UBCC
Z?
=0 J/TBTRUE
RETURN2
; CHECK HIT IN GROUP 1.
HIT1: LAB R[OE],SC K[.7],J/HIT
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D_D.LEFT2,SI/7,RETURN1
DC.5: Q_K[.8]
=0
DC.5A: CALL,J/DC5
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0 J/DC.5A
RETURN1
=0
DC.A: CALL,J/DC.5
D_D.LEFT,SI/ZERO,RETURN1
DC.9: Q_K[.8]
=0
DC.9A: CALL,J/DC9
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0 J/DC.9A
RETURN1
=0
DC.C: CALL,J/DC.9
ALU_K[.FFFF]
D_D.RIGHT,SI/7,RETURN1
=0
DC.6: CALL,J/DC.9
; SET SO IT WAS A HIT.
; CLEAR SO REFERENCE WAS A MISS.
; TRAPPED, SO SEE IF TB MISS TRAP.
; NOT TB MISS TRAP.
; TB MISS TRAP OCCURRED.
```

```

U 107D. 0018,0038,0580,0800,0000,1273 :2136
U 1273. 0100,003E,0380,0800,0000,0001 :2137
:2138
U 1098. 0000,003D,0180,0800,0000,1270 :2139
U 1099. 0018,0038,0180,0800,0000,1274 :2140
U 1274. 0500,003E,0380,0800,0000,0001 :2141
:2142
:2143
:2144
:2145
:2146
:2147
:2148
:2149
:2150
:2151
:2152
:2153
:2154
:2155
:2156
:2157
:2158
:2159
:2160
:2161
:2162
:2163
:2164
:2165
:2166
U 1275. 0F18,0038,0580,0800,0000,1276 :2167
U 1276. 0218,0038,0880,0800,0000,1277 :2168
U 1277. 0218,0038,0880,0800,0000,1278 :2169
U 1278. 0200,003C,0380,0800,0000,1279 :2170
U 1279. 0001,003C,0180,0AE0,0000,127A :2171
U 127A. 0000,003C,0180,0800,0084,727B :2172
U 127B. 0043,0010,0180,0AD8,0000,127C :2173
U 127C. 081B,0000,0580,0800,0000,127D :2174
U 127D. 0018,0038,21C0,0800,0000,127E :2175
U 127E. 0019,2014,0580,0800,0082,127F :2176
U 127F. 0003,001C,01C0,0800,0000,1280 :2177
U 1280. 001D,2014,0180,0AE8,0000,109A :2178
U 109A. 0000,003D,0180,0800,0000,126E :2179
U 109B. 0000,003C,0180,0A68,0000,1281 :2180
U 1281. 081C,2034,0180,0800,0000,1282 :2181
U 1282. 081C,2030,0180,0A60,0000,1283 :2182
U 1283. 0001,003C,0180,0980,0000,1088 :2183
U 1088. 0001,003D,0180,0AB0,0000,107A :2184
U 1089. 0000,003C,0180,0A58,0000,1284 :2185
U 1284. 081C,2034,0180,0988,0000,108A :2186
U 108A. 0001,003D,0180,0AA8,0000,1048 :2187
U 108B. 0001,003C,0180,0990,0000,10D8 :2188
U 10D8. 0000,003D,0180,0800,0000,1270 :2189
U 10D9. 0000,003C,0180,0A68,0000,1285 :2190

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```

ALU_K[.1]
D_D.LEFT2,SI/7,RETURN1
=0
DC.3: CALL,J/DC.9
ALU_K[.FFFF]
D_D.LEFT,SI/7,RETURN1
: THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
: A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
: SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
: FOLLOWING DATA PATTERNS:
:
: R[0B] 7FFFC000
: R[0C] A4000000
: R[0D] 001FFFFFF
:
: R[0] A4155555
: R[1] 4CCCC000
: R[2] 0AAAAA80
:
: R[3] A4199999
: R[4] 55554000
: R[5] 0CCCCC80
:
: R[6] A40AAAAA
: R[7] 33330000
: R[8] 05555500
:
: R[0] A4066666
: R[1] 2AAA8000
: R[2] 03333300
:
TBWPTP: D_0,ALU_K[.1]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7
R[0C] D
SC_K[.F]
ALU_MASK+1,R[0B],ALU.RIGHT,SI/ZERO
D_0=K[.1]
Q_K[.14]
A[U_Q+K[.1],SC_ALU
ALU_NOT.MASK,Q-ALU
ALU_Q[A+B]D,R[0D],ALU
=0 CALL,J/DC.5
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_LA[OR]D,D_ALU
R[0] D
=0 R[6] D,CALL,J/DC.C
LAB_R[0B]
ALU_LA[AND]D,D_ALU,R[1],ALU
=0 R[5] D,CALL,J/RELSUB
R[2] D
=0 CALL,J/DC.9
LAB_R[0D]

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U 1285.	081C.2034.0180.0800.0000.1286	:2191	ALU_LA[AND]D,D_ALU
U 1286.	081C.2030.0180.0A60.0000.1287	:2192	LAB_R[OC],ALU_[A[OR]D,D_ALU
U 1287.	0001.003C.0180.0998.0000.10DA	:2193	RC[3] D
U 10DA.	0001.003D.0180.0AB0.0000.126E	:2194	=0 RC[6] D,CALL,J/DC.5
U 10DB.	0000.003C.0180.0A58.0000.1288	:2195	LAB_R[OB]
U 1288.	081C.2034.0180.09A0.0000.10F8	:2196	ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 10F8.	0001.003D.0180.0AA8.0000.1048	:2197	=0 RC[5] D,CALL,J/RELSUB
U 10F9.	0001.003C.0180.09A8.0000.10FA	:2198	RC[5] D
U 10FA.	0000.003D.0180.0800.0000.1072	:2199	=0 CALL,J/DC.A
U 10FB.	0000.003C.0180.0A68.0000.1289	:2200	LAB_R[OD]
U 1289.	081C.2034.0180.0800.0000.128A	:2201	ALU_LA[AND]D,D_ALU
U 128A.	081C.2030.0180.0A60.0000.128B	:2202	LAB_R[OC],ALU_[A[OR]D,D_ALU
U 128B.	0001.003C.0180.09B0.0000.110A	:2203	RC[6] D
U 110A.	0001.003D.0180.0AB0.0000.1098	:2204	=0 RC[6] D,CALL,J/DC.3
U 110B.	0000.003C.0180.0A58.0000.128C	:2205	LAB_R[OB]
U 128C.	081C.2034.0180.09B8.0000.1150	:2206	ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 1150.	0001.003D.0180.0AA8.0000.1048	:2207	=0 RC[5] D,CALL,J/RELSUB
U 1151.	0001.003C.0180.09C0.0000.1152	:2208	RC[8] D
U 1152.	0000.003D.0180.0800.0000.107C	:2209	=0 CALL,J/DC.6
U 1153.	0000.003C.0180.0A68.0000.128D	:2210	LAB_R[OD]
U 128D.	081C.2034.0180.0800.0000.128E	:2211	ALU_LA[AND]D,D_ALU
U 128E.	081C.2030.0180.0A60.0000.128F	:2212	LAB_R[OC],ALU_[A[OR]D,D_ALU
U 128F.	0001.003C.0180.0A80.0000.1156	:2213	RC[0] D
U 1156.	0001.003D.0180.0AB0.0000.1072	:2214	=0 RC[6] D,CALL,J/DC.A
U 1157.	0000.003C.0180.0A58.0000.1290	:2215	LAB_R[OB]
U 1290.	081C.2034.0180.0A88.0000.1178	:2216	ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 1178.	0001.003D.0180.0AA8.0000.1048	:2217	=0 RC[5] D,CALL,J/RELSUB
U 1179.	0001.003E.0180.0A90.0000.0001	:2218	RC[2] D,RETURN1
		:2219	: THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
		:2220	: WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
		:2221	: WHICH COULD RESULT IN ERROR CONDITIONS.
U 1291.	0000.003F.0180.0800.0000.117C	:2222	TARGC3: SUB/SPEC
U 117C.	0000.003E.0180.0800.0000.0001	:2223	117C: RETURN1
U 117D.	0000.003E.0180.0800.0000.0002	:2224	117D: RETURN2
U 117E.	0000.003E.0180.0800.0000.0003	:2225	117E: RETURN3
U 117F.	0000.003E.0180.0800.0000.0004	:2226	117F: RETURN4
U 11FC.	0000.003D.0180.0800.0000.1219	:2227	11FC: ERROR1
U 11FD.	0000.003D.0180.0800.0000.1219	:2228	11FD: ERROR1
U 11FE.	0000.003D.0180.0800.0000.1219	:2229	11FE: ERROR1
U 11FF.	0000.003D.0180.0800.0000.1219	:2230	11FF: ERROR1


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:2231 .PAGE 'TEST A1 VAMX/VA, PAMX/VAMX, PA BUS AND TIME.OUT.ADDR REG TES
:2232 *****
:2233 **
:2234 TEST A1 VAMX/VA, PAMX/VAMX, PA BUS AND TIME OUT ADDR REG TEST
:2235
:2236 TEST DESCRIPTION
:2237 THIS IS A TEST OF THE PHYSICAL ADDRESS PATH FROM THE VA
:2238 ACROSS THE TB AND THE PA BUS INTO THE TIME
:2239 OUT ADDRESS REGISTER. THE TIME OUT ADDRESS REGISTER AND ITS
:2240 INTERFACE TO THE ID BUS IS ALSO TESTED. A 1 IS FLOATED ACROSS
:2241 A FIELD OF 0'S, AS IS A 0 ACROSS A FIELD OF 1'S
:2242 TO GENERATE THE TEST ADDRESSES.
:2243
:2244 ERROR DESCRIPTION
:2245 EXPECTED ADDRESS (IN CORRECT BIT POSITION)
:2246 GOT ADDRESS (OR TWO BITS OF WHERE THE BEN WENT IN BEN TESTING)
:2247 ERROR CODE:
:2248 0=> ADDRESS PATH FAILURE
:2249 1=> BRANCH FAILURE
:2250 EXPECTED VAMX<31:30> (INVERSE OF EXPECTED ADDRESS)
:2251
:2252 --
:2253 *****
:2254 =0
:2255 TBPADR: NEWTST
:2256 R[0F] 0
:2257 R[4] R[.1F] ; COUNTER R[4]=1F
:2258 ALU 0-K[.1],D_ALU ; GENERATE A MASK
:2259 D D.RIGHT2,S1/ZERO
:2260 ALU D[ANDNOT]K[.3],R[8]_ALU ; R[8]=3FFFFFFC
:2261 =0 CALC,J/CSOFF ; TURN SBI AND CACHE OFF.
:2262 NOP
:2263 =0 ERLOOP
:2264 TBPAD: SC K[.C]
:2265 ALU NOT.MASK,D_ALU ; UNLOCK TIME OUT
:2266 ID[SBI.ERR]_D ; ADDRESS REGISTER.
:2267 LAB_R[4] ; GENERATE TEST PATTERN ADDRESS
:2268 ALU_LA+K[.2],SC_ALU
:2269 ALU NOT.MASK,VA_ALU,R[5]_ALU,D_ALU
:2270 ALU_MASK,R[0B]_ALU
:2271 LAB_R[8] ; GENERATE EXPECTED RESULT
:2272 ALU_LA[AND]D,R[3]_ALU
:2273 FS/MCT,MCT/READ.P ; TEST INSTRUCTION.
:2274 Q_ID[TIME.ADDR] ; GET TIME OUT ADDRESS REG.
:2275 Q_Q.LEFT2,S1/ZERO ; CLEAR BITS<31:29> AND
:2276 Q_Q.LEFT,S1/ZERO ; ALIGN IT PROPERLY
:2277 Q_Q.RIGHT,S1/ZERO
:2278 D-R[3]
:2279 R[0F]_K[.4]
:2280 RC[0E]_D
:2281 RC[0D]_Q
:2282 ALU_Q-D,CLK.UBCC ; SEE IF THE RESULT WAS CORRECT
:2283 Z?
:2284 =0 ERROR1,RC[0C] 0 ; THE ADDRESS PATH FAILED.
:2285 ; NOW TEST BEN/VA<31:30>:
    
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U 117A, 0000,003D,0180,0800,0000,1076
U 117B, 0003,003C,0180,0AF8,0000,1292
U 1292, 0018,0038,8D80,0AA0,0000,1293
U 1293, 081B,0000,0580,0800,0000,1294
U 1294, 0200,003C,0180,0800,0000,1295
U 1295, 0019,0024,0D80,0AC0,0000,1188
U 1188, 0000,003D,0180,0800,0000,1222
U 1189, 0000,003C,0180,0800,0000,118A
U 118A, 0000,003D,0180,0800,0000,1218
U 118B, 0000,003C,8580,0800,0084,7296
U 1296, 0803,001C,0180,0800,0000,1297
U 1297, 0000,003C,6580,3C00,0000,1298
U 1298, 0000,003C,0180,0A20,0000,1299
U 1299, 0018,0014,0980,0800,0082,129A
U 129A, 0803,001C,0180,0AA8,0200,129B
U 129B, 0000,0038,0180,09D8,0000,129C
U 129C, 0000,003C,0180,0A40,0000,129D
U 129D, 001C,2034,0180,0A98,0000,129E
U 129E, 0000,003C,0180,C800,0000,129F
U 129F, 0000,003C,69F0,2C00,0000,12A0
U 12A0, 0000,003C,0188,0800,0000,12A1
U 12A1, 0000,003C,01A8,0800,0000,12A2
U 12A2, 0000,003C,01B0,0800,0000,12A3
U 12A3, 0800,003C,0180,0A18,0000,12A4
U 12A4, 0018,0038,1180,09F8,0000,12A5
U 12A5, 0001,003C,0180,09F0,0000,12A6
U 12A6, 0001,203C,0180,09E8,0000,12A7
U 12A7, 001D,2000,0180,0800,0010,12A8
U 12A8, 0000,013C,0180,0800,0000,118C
U 118C, 0003,003D,0180,09E0,0000,1219
    
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U 118D. 0F00.003C.01C0.0A28.0000.12A9 :2286 Q_R[5],D_0
U 12A9. 0000.003C.0180.09F0.0000.12AB :2287 RC[OE],LA
U 12AB. 0100.003C.0008.0A28.0200.12AC :2288 D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12AC. 0018.0038.0DC0.0800.0000.12AD :2289 Q_K[.3]
U 12AD. 001D.2000.01C0.0800.0000.12AE :2290 ALU_Q-D,Q_ALU
U 12AE. 0000.1C3C.0180.0800.0000.1007 :2291 PSL.MODE? : TEST INSTRUCTION.
U 1007. 0819.0000.0580.0800.0000.100F :2292 =00111 D_D-K[.1] : VAMUX<31:30>=11
U 100F. 0819.0000.0580.0800.0000.1017 :2293 D_D-K[.1] : VAMUX<31:30>=10
U 1017. 0819.0000.0580.0800.0000.101F :2294 D_D-K[.1] : VAMUX<31:30>=01
U 101F. 0001.003C.0180.0800.0010.12AF :2295 ALU_D,CLK.UBCC : VAMUX<31:30>=00
U 12AF. 001D.0114.0180.09E8.0000.118E :2296 Z?,ALU_D+Q,RC[OD],ALU
U 118E. 0018.0039.0580.09E0.0000.1219 :2297 =0 ERROR1,RC[OC],K[.1] : VA OR VAMUX <31:30> BITS
:2298 : OR BEN 1C INCORRECT.
:2299
U 118F. 0000.003C.0180.0800.0000.12B0 :2300 NOP
:2301 : NOW TEST COMPLEMENT PATTERNS
U 12B0. 0000.003C.0180.0A20.0000.12B1 :2302 TBPA1: LAB_R[4] : GENERATE THE
U 12B1. 0018.0014.0980.0800.0082.12B2 :2303 ALU_LA+K[.2],SC_ALU : TEST PATTERN
U 12B2. 0800.0038.0180.0AAB.0200.12B3 :2304 ALU_MASK,VA_ALU,R[5],ALU,D_ALU : LOAD THE VA
U 12B3. 0003.001C.0180.09D8.0000.12B4 :2305 ALU_NOT.MASK,RC[OB],ALU
U 12B4. 0000.003C.0180.0A40.0000.12B5 :2306 LAB_R[8] : GENERATE THE EXPECTED RESULT
U 12B5. 001C.2034.0180.0A98.0000.12B6 :2307 ALU_LA[AND]D,R[3],ALU
U 12B6. 0000.003C.0180.0800.0000.12B7 :2308 FS/MCT,MCT/READ.P : TEST INSTRUCTION
U 12B7. 0000.003C.69F0.2C00.0000.12B8 :2309 Q_ID[TIME.ADDR] : GET THE RESULT
U 12B8. 0000.003C.0188.0800.0000.12B9 :2310 Q_Q.LEFT2,SI/ZERO : CLEAR BITS <31:29> AND
U 12B9. 0000.003C.01A8.0800.0000.12BA :2311 Q_Q.LEFT,SI/ZERO : ALIGN IT PROPERLY
U 12BA. 0000.003C.0180.0800.0000.12BB :2312 Q_Q.RIGHT,SI/ZERO
U 12BB. 0800.003C.0180.0A18.0000.12BC :2313 D_R[3]
U 12BC. 0800.0024.0D80.0800.0000.12BD :2314 ALU_D[ANDNOT]K[.3],D_ALU
U 12BD. 0018.0038.1180.09F8.0000.12BE :2315 RC[OF],K[.4]
U 12BE. 0001.003C.0180.09F0.0000.12BF :2316 RC[OE],D
U 12BF. 0001.203C.0180.09E8.0000.12C0 :2317 RC[OD],Q
U 12C0. 001D.2000.0180.0800.0010.12C1 :2318 ALU_Q-D,CLK.UBCC : SEE IF THE RESULT IS CORRECT
U 12C1. 0000.013C.0180.0800.0000.1190 :2319 Z?
U 1190. 0003.003D.0180.09E0.0000.1219 :2320 =0 ERROR1,RC[OC],0 : ADDRESS PATH FAILED
:2321 : NO TEST THE BRANCH ENABLE VA<31:30>
U 1191. 0F00.003C.01C0.0A28.0000.12C2 :2322 Q_R[5],D_0
U 12C2. 0000.003C.0180.09F0.0000.12C3 :2323 RC[OE],LA
U 12C3. 0100.003C.0008.0A28.0200.12C4 :2324 D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12C4. 0018.0038.0DC0.0800.0000.12C5 :2325 Q_K[.3]
U 12C5. 001D.2000.01C0.0800.0000.12C6 :2326 ALU_Q-D,Q_ALU
U 12C6. 0000.1C3C.0180.0800.0000.1027 :2327 PSL.MODE? : TEST INSTRUCTION
U 1027. 0819.0000.0580.0800.0000.102F :2328 =00111 D_D-K[.1] : VAMUX<31:30>=11
U 102F. 0819.0000.0580.0800.0000.1037 :2329 D_D-K[.1] : VAMUX<31:30>=10
U 1037. 0819.0000.0580.0800.0000.103F :2330 D_D-K[.1] : VAMUX<31:30>=01
U 103F. 0001.003C.0180.0800.0010.12C7 :2331 ALU_D,CLK.UBCC : VAMUX<31:30>=00
U 12C7. 001D.2114.0180.09E8.0000.1192 :2332 Z?,ALU_Q+D,RC[OD],ALU
U 1192. 0018.0039.0580.09E0.0000.1219 :2333 =0 ERROR1,RC[OC],K[.1] : VA OR VAMUX <31:30> BITS
:2334 : OR BEN 1C INCORRECT.
:2335
U 1193. 0000.003C.0180.0A20.0010.12C8 :2336 ALU_R[4],CLK.UBCC : SEE IF ALL PATTERNS
U 12C8. 0000.013C.0180.0800.0000.1194 :2337 Z? : HAVE BEEN TESTED
U 1194. 0018.0000.0580.0AA0.0000.118B :2338 =0 R[4],LA-K[.1],J/TBPA0
U 1195. 0000.003C.0180.0800.0000.1196 :2339 NOP
    
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:2338 .PAGE 'TEST A2 VAMX IN COMPATIBILITY MODE TEST'
:2339 *****
:2340 **
:2341 TEST A2 VAMX COMPATIBILITY MODE TEST
:2342
:2343 TEST DESCRIPTION
:2344 THIS IS A TEST OF THE VAMUX IN COMPATIBILITY MODE
:2345 WHEN THE PSL <31>=1 AND NOT IN CONSOLE COMMAND MODE
:2346 VAMUX <31:16>=0.
:2347
:2348 ERROR DESCRIPTION
:2349 TEST ADDRESS PATTERN
:2350 GOT ADDRESS
:2351
:2352 --
:2353 *****
:2354 =0
:2355 TBPCM: NEWTST
:2356 R[0F]_0
:2357 R[4]_R[1F] ; COUNTER R[4]=1F
:2358 SC_K[10] ; SET UP A MASK
:2359 ALU_MASK+1,D_ALU
:2360 ALU_NOT.D,D_ALU
:2361 ALU_D[ANDNOT]K[.3],R[8]_ALU ; R[8]=FFFC
:2362 =0 CAL[,J/CSOFF ; TURN SBI AND CACHE OFF.
:2363 NOP
:2364 =0 ERLOOP
:2365 TBPM0: SC_K[.C] ; UNLOCK TIME OUT ADDRESS REGISTER
:2366 ALU_NOT.MASK,D_ALU
:2367 ID[SBI.ERR]_D
:2368 LAB_R[4] ; GENERATE TEST PATTERN ADDRESS
:2369 ALU_LA+K[.2],SC_ALU
:2370 ALU_NOT.MASK,VA_ALU,R[5]_ALU,D_ALU ; LOAD THE VA
:2371 LAB_R[8] ; GENERATE THE
:2372 ALU_LACAND]D,R[3]_ALU ; EXPECTED RESULT
:2373 SC_R[1F]
:2374 ALU_NOT.MASK,D_ALU
:2375 CID7CONT ; GET OUT OF CONSOLE MODE
:2376 ID[PSL]_D ; SET PSL <31> , CM
:2377 NOP
:2378 FS/MCT,MCT/READ.P ; TEST INSTRUCTION.
:2379 Q_ID[TIME.ADDR],D_0 ; GET TIME OUT ADDRESS REG.
:2380 ID[PSL]_D ; CLEAR THE COMPATIBILITY MODE BIT
:2381 Q-Q.LEFT2,S1/ZERO ; CLEAR BITS <31:29> OF THE
:2382 Q-Q.LEFT,S1/ZERO ; RESULT AND ALIGN
:2383 Q-Q.RIGHT,S1/ZERO ; IT PROPERLY
:2384 D-R[3]
:2385 R[0F]_K[.2]
:2386 RC[0E]_D
:2387 RC[0D]_Q
:2388 ALU_Q-D,CLK.UBCC ; IS THE RESULT CORRECT?
:2389 Z?
:2390 =0 ERROR1 ; REPORT ERROR
:2391 ; NOW TEST BEN VA<31:30> IN COMPATIBILITY MODE
:2392 Q_R[5],D_0
    
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U 1196, 0000,003D,0180,0800,0000,1076
U 1197, 0003,003C,0180,0AF8,0000,12C9
U 12C9, 0018,0038,8D80,0AA0,0000,12CA
U 12CA, 0000,003C,6580,0800,0084,72CB
U 12CB, 0803,0010,0180,0800,0000,12CC
U 12CC, 0801,0028,0180,0800,0000,12CD
U 12CD, 0019,0024,0D80,0AC0,0000,1198
U 1198, 0000,003D,0180,0800,0000,1222
U 1199, 0000,003C,0180,0800,0000,119A
U 119A, 0000,003D,0180,0800,0000,1218
U 119B, 0000,003C,8580,0800,0084,72CE
U 12CE, 0803,001C,0180,0800,0000,12CF
U 12CF, 0000,003C,6580,3C00,0000,12D0
U 12D0, 0000,003C,0180,0A20,0000,12D1
U 12D1, 0018,0014,0980,0800,0082,12D2
U 12D2, 0803,001C,0180,0AA8,0200,12D3
U 12D3, 0000,003C,0180,0A40,0000,12D4
U 12D4, 001C,2034,0180,0A98,0000,12D5
U 12D5, 0000,003C,8D80,0800,0084,72D6
U 12D6, 0803,001C,0180,0800,0000,12D7
U 12D7, 0000,003C,0180,1C00,0000,12D8
U 12D8, 0000,003C,3D80,3C00,0000,12D9
U 12D9, 0000,003C,0180,0800,0000,12DA
U 12DA, 0000,003C,0180,C800,0000,12DB
U 12DB, 0F00,003C,69F0,2C00,0000,12DC
U 12DC, 0000,003C,3D80,3C00,0000,12DD
U 12DD, 0000,003C,0188,0800,0000,12DE
U 12DE, 0000,003C,01A8,0800,0000,12DF
U 12DF, 0000,003C,0180,0800,0000,12E0
U 12E0, 0800,003C,0180,0A18,0000,12E1
U 12E1, 0018,0038,0980,09F8,0000,12E2
U 12E2, 0001,003C,0180,09F0,0000,12E3
U 12E3, 0001,203C,0180,09E8,0000,12E4
U 12E4, 001D,2000,0180,0800,0010,12E5
U 12E5, 0000,013C,0180,0800,0000,119C
U 119C, 0000,003D,0180,0800,0000,1219
U 119D, 0F00,003C,01C0,0A28,0000,12E6
    
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U 12E6. 0000,003C,0180,09F0,0000,12E7 :2393 RC[OE] LA
U 12E7. 0000,003C,8D80,0800,0084,72E8 :2394 SC K[.TF]
U 12E8. 0803,001C,0180,0800,0000,12E9 :2395 ALD NOT.MASK,D_ALU
U 12E9. 0000,003C,3D80,3C00,0000,12EA :2396 ID[PSL]_D ; SET COMPATIBILITY MODE BIT
U 12EA. 0F00,003C,0180,0800,0000,12EB :2397 D_0
U 12EB. 0100,003C,0008,0A28,0200,12EC :2398 D-D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12EC. 0000,1C3C,0180,0800,0000,1047 :2399 PSL.MODE? ; TEST INSTRUCTION
U 1047. 0000,003D,0180,0800,0000,1219 :2400 =00111 ERROR1 ; VAMUX<31:30>=11
U 104F. 0000,003D,0180,0800,0000,1219 :2401 ERROR1 ; VAMUX<31:30>=10
U 1057. 0000,003D,0180,0800,0000,1219 :2402 ERROR1 ; VAMUX<31:30>=01
U 105F. 0F00,003C,0180,0800,0000,12ED :2403 D_0 ; RESULT CORRECT
U 12ED. 0000,003C,3D80,3C00,0000,12EE :2404 ID[PSL]_D ; CLEAR COMPATIBILITY MODE
:2405 ; NOW TEST COMPLEMENT PATTERN
TBCM1: :2406 LAB_R[4] ; GENERATE TEST ADDRESS PATTERN
:2407 ALU_LA+K[.2],SC_ALU
:2408 ALU_MASK,VA_ALU,R[5]_ALU,D_ALU ; LOAD THE VA
:2409 LAB_R[8] ; GENERATE THE EXPECTED RESULT
U 12F1. 0000,003C,0180,0A40,0000,12F2 :2410 ALU_LA[AND]D,R[3]_ALU
U 12F2. 001C,2034,0180,0A98,0000,12F3 :2411 SC R[.1F]
U 12F3. 0000,003C,8D80,0800,0084,72F4 :2412 ALD NOT.MASK,D_ALU
U 12F4. 0803,001C,0180,0800,0000,12F5 :2413 CID7CONT ; MAKE SURE NOT IN CONSOLE MODE
U 12F5. 0000,003C,0180,1C00,0000,12F6 :2414 ID[PSL]_D ; SET COMPATIBILITY MODE BIT
U 12F6. 0000,003C,3D80,3C00,0000,12F7 :2415 NOP
U 12F7. 0000,003C,0180,0800,0000,12F8 :2416 FS/MCT,MCT/READ.P ; TEST INSTRUCTION
U 12F8. 0000,003C,0180,C800,0000,12F9 :2417 Q_ID[TIME.ADDR],D_0 ; GET THE RESULT
U 12F9. 0F00,003C,69F0,2C00,0000,12FA :2418 ID[PSL]_D ; CLEAR COMPATIBILITY MODE BIT
U 12FA. 0000,003C,3D80,3C00,0000,12FB :2419 Q_Q.LEFT2,SI/ZERO ; CLEAR BITS <31:29> OF THE RESULT
U 12FB. 0000,003C,0188,0800,0000,12FC :2420 Q_Q.LEFT,SI/ZERO ; AND ALIGN IT PROPERLY
U 12FC. 0000,003C,01A8,0800,0000,12FD :2421 Q_Q.RIGHT,SI/ZERO
U 12FD. 0000,003C,0180,0800,0000,12FE :2422 D_R[3]
U 12FE. 0800,003C,0180,0A18,0000,12FF :2423 A[U_D[ANDNOT]K[.3],D_ALU
U 12FF. 0819,0024,0D80,0800,0000,1300 :2424 RC[OF]_K[.2]
U 1300. 0018,0038,0980,09F8,0000,1301 :2425 RC[OE]_D
U 1301. 0001,003C,0180,09F0,0000,1302 :2426 RC[OD]_Q
U 1302. 0001,203C,0180,09E8,0000,1303 :2427 ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
U 1303. 001D,2000,0180,0800,0010,1304 :2428 Z?
U 1304. 0000,013C,0180,0800,0000,119E :2429 =0 ERROR1 ; REPORT ERROR
U 119E. 0000,003D,0180,0800,0000,1219 :2430 ; NOW TEST BEN VA<31:30>
:2431 Q_R[5],D_0
U 119F. 0F00,003C,01C0,0A28,0000,1305 :2432 RC[OE] LA
U 1305. 0000,003C,0180,09F0,0000,1306 :2433 D-D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 1306. 0100,003C,0008,0A28,0200,1307 :2434 SC K[.1F]
U 1307. 0000,003C,8D80,0800,0084,7308 :2435 ALD NOT.MASK,D_ALU
U 1308. 0803,001C,0180,0800,0000,1309 :2436 ID[PSL]_D ; SET COMPATIBILITY MODE BIT
U 1309. 0000,003C,3D80,3C00,0000,130A :2437 NOP
U 130A. 0000,003C,0180,0800,0000,130B :2438 PSL.MODE? ; TEST INSTRUCTION
U 130B. 0000,1C3C,0180,0800,0000,1067 :2439 =00111 ERROR1 ; VAMUX<31:30>=11
U 1067. 0000,003D,0180,0800,0000,1219 :2440 ERROR1 ; VAMUX<31:30>=10
U 106F. 0000,003D,0180,0800,0000,1219 :2441 ERROR1 ; VAMUX<31:30>=01
U 1077. 0000,003D,0180,0800,0000,1219 :2442 D_0 ; VAMUX<31:30>=00
U 107F. 0F00,003C,0180,0800,0000,130C :2443 ID[PSL]_D ; CLEAR COMPATIBILITY MODE
U 130C. 0000,003C,3D80,3C00,0000,130D :2444 ALU_R[4],CLK.UBCC ; FINISHED TEST?
U 130D. 0000,003C,0180,0A20,0010,130E :2445 Z?
U 130E. 0000,013C,0180,0800,0000,11A0 :2446 =0 R[4]_LA-K[.1],J/TBCM0
U 11A0. 0018,0000,0580,0AA0,0000,119B :2447 NOP
U 11A1. 0000,003C,0180,0800,0000,11A2 :2447
    
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U 11A2, 0000,003D,0180,0800,0000,1076
U 11A3, 0000,003C,8580,0800,0084,730F
U 130F, 0803,001C,0180,0800,0000,1310
U 1310, 0000,003C,6580,3C00,0000,1311
U 1311, 0000,003C,8D80,0800,0084,7312
U 1312, 0803,001C,0180,0800,0000,1313
U 1313, 0000,003C,0180,1C00,0000,1314
U 1314, 0000,003C,3D80,3C00,0000,1315
U 1315, 0F00,003C,0180,0800,0000,11A4
U 11A4, 0000,003D,4980,3C00,0000,1222
U 11A5, 081B,001C,0D80,0800,0200,1316
U 1316, 0100,003C,0180,0800,0000,1317
U 1317, 0200,003C,0180,0800,0000,1318
U 1318, 0001,003C,0180,09F0,0000,1319
U 1319, 0018,0038,0980,09F8,3C00,131A
U 131A, 0000,003C,0180,5000,3C00,131B
U 131B, 0F00,003C,69F0,2C00,0000,131C
U 131C, 0000,003C,3D80,3C00,0000,131D
U 131D, 0000,003C,0188,0800,0000,131E
U 131E, 0000,003C,01A8,0800,0000,131F
U 131F, 0000,003C,0180,0800,0000,1320
U 1320, 0810,0038,0180,0970,0000,1321
U 1321, 0001,203C,0180,09E8,0000,1322
U 1322, 001D,2000,0180,0800,0010,1323
U 1323, 0000,013C,0180,0800,0000,11A6
U 11A6, 0000,003D,0180,0800,0000,1219
U 11A7, 0000,003C,0180,0800,0000,11A8

.PAGE "TEST A3 MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX"

++
TEST A3 MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX
TEST DESCRIPTION
THIS IS A TEST OF MSC/INHIBIT COMPATIBILITY MODE AND ITS
AFFECT UPON THE VAMUX.
ERROR DESCRIPTION
EXPECTED ADDRESS
GOT ADDRESS
--

=0
INCM: NEWTST
SC_K[C] ; UNLOCK TIME OUT ADDRESS REGISTER.
ALU_NOT.MASK,D_ALU
ID[SB1.ERR]_D
SC_K[1F]
ALU_NOT.MASK,D_ALU
CID7CONT ; GET OUT OF CONSOLE MOE
ID[PSL]_D ; SET COMPATIBILITY MODE
D_0
=0 ID[BERO]_D,CALL,J/CSOFF ; TURN OFF MME AND CACHE
ALU_NOT.K[3],D_ALU,VA_ALU ; LOAD THE VA
D_D.LEFT2,SI/ZERO ; COMPUTE THE EXPECTED RESULT
D_D.RIGHT2,SI/ZERO
RC[OE]_D
RC[OF]_K[2],MSC/INH.CM.ADDR
FS/MCT,MCT/READ.V.WCHK,MSC/INH.CM.ADDR ; TEST INSTRUCTION
Q_ID[TIME.ADDR],D_0 ; GET THE RESULT
ID[PSL]_D ; CLEAR COMPATIBILITY MODE
Q_Q.LEFT2,SI/ZERO ; CLEAR BITS<31:29> OF THE RESULT
Q_Q.LEFT,SI/ZERO ; AND ALIGN IT PROPERLY
Q_Q.RIGHT,SI/ZERO
D_RC[OE]
RC[OD]_Q
ALU_Q-D,CLK.UBCC ; RESULT CORRECT?
Z?
=0 ERROR1
NOP


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:2491 .PAGE 'TEST A4 TB WRITE PULSE LOGIC TEST'
:2492 *****
:2493 ++
:2494 TEST A4 TB WRITE PULSE TEST
:2495
:2496 TEST DESCRIPTION
:2497 THIS IS A TEST OF THE TB WRITE PULSE LOGIC, SIMPLE
:2498 HITS AND MISSES. ALSO TESTED IMPLICITLY IS THE ABILITY
:2499 THE PARITY CHECKERS AND GENERATORS TO OPERATE CORRECTLY
:2500 UPON SIMPLE DATA PATTERNS. LOCATION 0 IS USED IN
:2501 BOTH GROUPS OF THE TB. LOCATION 0 MEANS VA<31>=VA<13:09>=0.
:2502 NOTE THAT THE FORCE REPLACE BITS
:2503 IN TBERO ARE USED EXTENSIVELY.
:2504 THE TEST SEQUENCE IS:
:2505 1 WRITE (VA=2AAA8000 PTE=A4066666) INTO BOTH GROUPS
:2506 2 WRITE (VA=4CCCC000 PTE=A4155555) INTO GROUP 0 AND
:2507 CHECK WRITE PULSE
:2508 3 WRITE (VA=55554000 PTE=A4199999) INTO GROUP 1 AND
:2509 CHECK WRITE PULSE
:2510 4 READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 0
:2511 5 READ (VA=55554000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
:2512 6 WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
:2513 7 READ (VA=4CCCC000) AND
:2514 CHECK FOR MISS TO BOTH GROUPS
:2515 8 READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
:2516 9 READ (VA=55554000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
:2517 A WRITE (VA=2AAA8000 PTE=A4066666) INTO GROUP 1
:2518 B READ (VA=55554000) AND
:2519 CHECK FOR MISS IN BOTH GROUPS
:2520 C READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
:2521 D READ (VA=2AAA8000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 1
:2522 E WRITE (VA=4CCCC000 PTE=A4155555) INTO BOTH GROUPS
:2523 F READ (VA=33330000) AND
:2524 CHECK FOR MISS IN BOTH GROUPS
:2525 10 READ (VA=2AAA8000) AND
:2526 CHECK FOR MISS IN BOTH GROUPS
:2527 11 READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 0
:2528 12 WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
:2529 13 READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 1
:2530 14 READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
:2531 15 WRITE (VA=55554000 PTE=A4199999) INTO A RANDOM GROUP
:2532 16 WRITE (VA=2AAA8000 PTE=A4066666) INTO A RANDOM GROUP
:2533 (DIFFERENT GROUP THAN THE ONE USED IN 21)
:2534 17 READ (VA=55554000 PTE=A4199999) AND
:2535 CHECK FOR HIT IN GROUP AS
:2536 DETERMINED BY WRITE PULSE
:2537 GENERATED IN 21 AND 22
:2538 18 READ (VA=2AAA8000 PTE=A4066666) AND
:2539 CHECK FOR HIT IN GROUP AS
:2540 DETERMINED IN 23 (HERE USE THE
:2541 OTHER GROUP)
:2542 19 WRITE (VA=4CCCC000 PTE=A4155555) INTO GROUP 1
:2543 1A WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
:2544 1B WRITE HIT (VA=4CCCC000 PTE=A4199999) SHOULD
:2545 GO INTO GROUP 1

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:2546      1C  READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
:2547      1D  READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
:2548      1E  WRITE HIT (VA=33330000 PTE=A4066666) SHOULD
:2549              GO INTO GROUP 0
:2550      1F  READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
:2551      20  READ (VA=33330000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 0
:2552      21  SET FORCE MISS GROUP 0 BIT
:2553      22  READ (VA=33330000) AND
:2554              CHECK FOR MISS IN BOTH GROUPS
:2555      23  CLEAR FORCE MISS GROUP 0 BIT
:2556      24  READ (VA=33330000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 0
:2557      25  SET FORCE MISS GROUP 1 BIT
:2558      26  READ (VA=4CCCC000) AND
:2559              CHECK FOR MISS IN BOTH GROUPS
:2560      27  CLEAR FORCE MISS GROUP 1 BIT
:2561      28  READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
:2562      DONE
:2563
:2564      ERROR DESCRIPTION
:2565
:2566      SUBTEST 1:
:2567      EXPECTED TBER1
:2568      GOT TBER1
:2569      N/A
:2570      N/A
:2571      VA WRITTEN
:2572      N/A
:2573
:2574      SUBTEST 2:
:2575      EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
:2576      OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
:2577      ACTUAL TBER0
:2578      EXPECTED TIME OUT ADDRESS REGISTER
:2579      ACTUAL TIME OUT ADDRESS REGISTER
:2580      VA WRITTEN
:2581      UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
:2582      FLAG          UTRAP TYPE
:2583      ----          -
:2584      DE          NO UTRAP OCCURRED
:2585      SE          TB PARITY ERROR
:2586      9E          TB MISS
:2587      CE          TB PROTECTION ERROR
:2588      D6          TB MODIFY BIT ERROR
:2589      DA          X PAGE UTRAP
:2590      DC          UNALIGNED DATA UTRAP
:2591
:2592      --
:2593      *****
:2594      =0
:2595      TBWPA:  NEWTST
:2596              NOP
:2597      =0      CALL,J/CSOFF          : TURN OFF THE CACHE AND SBI
:2598              NOP
:2599      =0      CALL,J/TBWPTP        : GENERATE SOME TEST PATTERNS
:2600              D_0
    
```

```

U 11A8, 0000,003D,0180,0800,0000,1076
U 11A9, 0000,003C,0180,0800,0000,11AA
U 11AA, 0000,003D,0180,0800,0000,1222
U 11AB, 0000,003C,0180,0800,0000,11AC
U 11AC, 0000,003D,0180,0800,0000,1275
U 11AD, 0F00,003C,0180,0800,0000,11AE
    
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U 11AE, 0000,003D,0180,0800,0000,1014 :2601 =0 CALL J/DC.DE
U 11AF, 0001,003C,0180,0AF0,0000,1180 :2602 R[OE] D ; R[OE]=DE, THE UTRAP FLAG
U 11B0, 0000,003D,0180,0800,0000,1218 :2603 =0 ERLOOP
U 11B1, 0018,0038,D580,09F8,0000,1324 :2604 RC[OF] K[.6] ; RESET SUBTEST NUMBER
U 1324, 0000,003C,8580,0800,0084,7325 :2605 SC K[.] ; UNLOCK THE TIME OUT ADDRESS REGISTER
U 1325, 0803,001C,0180,0800,0000,1326 :2606 ALD NOT.MASK,D_ALU
U 1326, 0000,003C,6580,3C00,0000,1182 :2607 ID[SBI.ERR]_D
U 11B2, 0000,003D,0180,0800,0000,121D :2608 =0 SUBTEST
:2609 ///////////////////////////////////////////////////
:2610 [1] WRITE INTO BOTH GROUPS:
:2611 VA=2AAA8000
:2612 PTE=A4066666
:2613
:2614 VA R[1] ; R[1]=2AAA8000
:2615 LAB R[0] ; R[0]=A4066666
U 11B3, 0000,003C,0180,0A08,0200,1327 :2614
U 1327, 0000,003C,0180,0A00,0000,1184 :2615
U 11B4, 0000,003D,0180,0AC0,0000,1044 :2616 =0 R[8] LA,CALL,J/TBWRB ; TBWRB WRITES INTO BOTH TB GROUPS
:2617 ///////////////////////////////////////////////////
:2618 [2] WRITE INTO GROUP 0:
:2619 VA=4CCCC000
:2620 PTE=A4155555
:2621 AND CHECK THE GROUP 0 WRITE PULSE IN TBER1
:2622
:2623 VA R[1] ; R[1]=4CCCC000
:2624 RC[0A] LC
:2625 LC R[0] ; R[0]=A4155555
U 11B5, 0010,0038,0180,0908,0200,1328 :2623
U 1328, 0010,0038,0180,09D0,0000,1329 :2624
U 1329, 0000,003C,0180,0900,0000,11B6 :2625
U 11B6, 0010,0039,0180,0AC0,0000,103C :2626 =0 R[8] LC,CALL,J/TBWRO ; TBWRO WRITES INTO TB GROUP 0
U 11B7, 0000,003C,D580,0800,0084,732A :2627 SC K[.6] ; CHECK TBER1<6> THE WRITE PULSE BIT
U 132A, 0003,003C,0180,09F0,0000,132B :2628 RC[OE] 0
U 132B, 0001,2024,0180,0800,0010,132C :2629 ALU_Q.ANDNOT.MASK,CLK.UBCC
U 132C, 0000,013C,0180,0800,0000,11B8 :2630 Z?
U 11B8, 0001,203D,0180,09E8,0000,1219 :2631 =0 RC[OD] Q,ERROR1 ; THE TB WRITE PULSE BIT WAS INCORRECT.
:2632 ///////////////////////////////////////////////////
:2633 [3] WRITE INTO GROUP 1:
:2634 VA=55554000
:2635 PTE=A4199999
:2636 AND CHECK THE WRITE PULSE BIT IN TBER1
:2637
:2638 VA R[4] ; R[4]=55554000
:2639 RC[0A] LC
:2640 LC R[3] ; R[3]=A4199999
U 11B9, 0010,0038,0180,0920,0200,132D :2638
U 132D, 0010,0038,0180,09D0,0000,132E :2639
U 132E, 0000,003C,0180,0918,0000,11BA :2640
U 11BA, 0010,0039,0180,0AC0,0000,1024 :2641 =0 R[8] LC,CALL,J/TBWR1 ; TBWR1 WRITES INTO GROUP 1
U 11BB, 0000,003C,D580,0800,0084,732F :2642 SC K[.6] ; CHECK THE WRITE PULSE BIT
U 132F, 0003,001C,0180,09F0,0000,1330 :2643 ALD NOT.MASK,RC[OE] ALU
U 1330, 0001,2024,0180,0800,0010,1331 :2644 ALU_Q.ANDNOT.MASK,CLK.UBCC
U 1331, 0000,013C,0180,0800,0000,11BC :2645 Z?
U 11BC, 0000,003C,0180,0800,0000,11BF :2646 =0 J/TBWPB
U 11BD, 0001,203D,0180,09E8,0000,1219 :2647 RC[OD] Q,ERROR1 ; TBER1<6> THE WRITE PULSE BIT WAS INCORRECT
U 11BE, 0000,003D,0180,0800,0000,121D :2648 =0 SUBTEST
:2649 ///////////////////////////////////////////////////
:2650 [4] READ
:2651 VA=4CCCC000
:2652 CHECK FOR HIT IN GROUP 0
:2653 WITH RELOCATED ADDRESS (IN TIME OUT ADDRESS REGISTER)
:2654 OAAAAA80
:2655

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U 11BF, 0010,0038,0180,0908,0200,1332 :2656
U 1332, 0010,0038,0180,09D0,0000,1333 :2657
U 1333, 0000,003C,0180,0910,0000,1080 :2658
U 1080, 0010,0039,0180,0AB8,0000,124C :2659
U 1081, 0000,003D,0180,0800,0000,1219 :2660
U 1082, 0000,003D,0180,0800,0000,1219 :2661
U 1083, 0000,003D,0180,0800,0000,1219 :2662
U 1084, 0000,003D,0180,0800,0000,1232 :2663
U 1085, 0000,003D,0180,0800,0000,1219 :2664
U 1086, 0000,003D,0180,0800,0000,1219 :2665
U 1087, 0000,003C,0180,0000,0000,1334 :2666
U 1334, 0000,1D3C,0180,0800,0000,109C :2667
U 109C, 0000,003C,0180,0800,0000,1335 :2668
U 109D, 0000,003D,0180,0800,0000,1219 :2669
U 109E, 0000,003D,0180,0800,0000,1219 :2670
U 109F, 0000,003D,0180,0800,0000,1219 :2671
U 1335, 0000,003C,0180,0800,0000,1336 :2672
:2673
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:2675
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U 1336, 0010,0038,0180,0920,0200,1337 :2681
U 1337, 0010,0038,0180,09D0,0000,1338 :2682
U 1338, 0000,003C,0180,0928,0000,1088 :2683
U 1088, 0010,0039,0180,0AB8,0000,1258 :2684
U 1089, 0000,003D,0180,0800,0000,1219 :2685
U 108A, 0000,003D,0180,0800,0000,1219 :2686
U 108B, 0000,003D,0180,0800,0000,1219 :2687
U 108C, 0000,003D,0180,0800,0000,1232 :2688
U 108D, 0000,003D,0180,0800,0000,1219 :2689
U 108E, 0000,003D,0180,0800,0000,1219 :2690
U 108F, 0000,003C,0180,0000,0000,1339 :2691
U 1339, 0000,1D3C,0180,0800,0000,108C :2692
U 108C, 0000,003C,0180,0800,0000,133A :2693
U 108D, 0000,003D,0180,0800,0000,1219 :2694
U 108E, 0000,003D,0180,0800,0000,1219 :2695
U 108F, 0000,003D,0180,0800,0000,1219 :2696
U 133A, 0000,003C,0180,0800,0000,133B :2697
:2698
:2699
:2700
:2701
:2702
U 133B, 0010,0038,0180,0938,0200,133C :2703
U 133C, 0010,0038,0180,09D0,0000,133D :2704
U 133D, 0000,003C,0180,0930,0000,11C0 :2705
U 11C0, 0010,0039,0180,0AC0,0000,103C :2706
U 11C1, 0000,003C,0180,0800,0084,733E :2707
U 133E, 0003,003C,0180,09F0,0000,133F :2708
U 133F, 0001,2024,0180,0800,0010,1340 :2709
U 1340, 0000,013C,0180,0800,0000,11C2 :2710

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TBWPB: VA RC[1] ; RC[1]=4CCCC000
RC[0A] LC
LC RC[2] ; RC[2]=0AAAAA80
=000 R[7] LC,CALL,J/HIT0 ; HIT0 CHECKS FOR A HIT IN GROUP 0
ERROR1 ; A NON TB MISS TRAP OCCURRED.
ERROR1 ; A TB MISS TRAP OCCURRED.
ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET CORRECTLY.
CALL,J/RELCHK ; CHECK RELOCATION.
ERROR1 ; A UTRAP OCCURRED.
ERROR1 ; NO TRAP BUT RELOCATION INCORRECT.
FS/MCT,MCT/TEST.RCHK ; TEST BEN/TB.TEST
BEN/TB.TEST ; TEST INSTRUCTION FOR BEN/TB.TEST
=11100 J/TPB1 ;
ERROR1 ; BRANCH WENT TO WRONG ADDRESS
ERROR1
ERROR1
TPB1: NOP
:////////////////////
: [5] READ
: VA=55554000
: CHECK FOR HIT IN GROUP 1
: AND CHECK RELOCATED ADDRESS (AS IT APPEARS IN THE TIME OUT
: ADDRESS REGISTER:
: 0CCCCC80
:
: VA RC[4] ; RC[4]=55554000
: RC[0A] LC
: LC RC[5] ; RC[5]=0CCCCC80
=000 R[7] LC,CALL,J/HIT1 ; HIT1 CHECKS FOR A HIT IN GROUP 1.
ERROR1 ; A NON TB MISS TRAP OCCURRED.
ERROR1 ; A TB MISS TRAP OCCURRED.
ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET CORRECTLY.
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS.
ERROR1 ; A TRAP OCCURRED.
ERROR1 ; NO UTRAP BUT RELOCATION INCORRECT.
FS/MCT,MCT/TEST.RCHK ; TEST THE BEN/TB.TEST
BEN/TB.TEST ; TEST INSTRUCTION FOR BRANCH TB.TEST
=11100 J/TPB2 ;
ERROR1 ; BRANCH WENT TO WRONG ADDRESS
ERROR1
ERROR1
TPB2: NOP
:////////////////////
: [6] WRITE INTO GROUP 0
: VA=33330000
: PTE=A40AAAAA
:
: VA RC[7] ; RC[7]=33330000
: RC[0A] LC
: LC RC[6] ; RC[6]=A40AAAAA
=0 R[8] LC,CALL,J/TBWRO ; TBWRO WRITES INTO TB GROUP 0
SC K[6] ; CHECK THE WRITE PULSE BIT IN TBERO
RC[0E] 0
ALU_Q.ANDNOT.MASK,CLK.UBCC
Z?

```



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U 11C2, 0001,203D,0180,09E8,0000,1219 :2711 =0 RC[0D]_Q,ERROR1 ; WRITE PULSE BIT IN TBERO INCORRECT
U 11C3, 0000,003C,0180,0800,0000,1341 :2712 NOP
:2713 :////////////////////
:2714 : [7] READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS
:2715 :
U 1341, 0010,0038,0180,0908,0200,1008 :2716 VA RC[1] ; RC[1]=4CCCC000
U 1008, 0010,0039,0180,09D0,0000,1242 :2717 =00 RC[0A]_LC,CALL,J/MISS ; MISS CHECKS FOR TB MISS IN BOTH GROUPS
U 1009, 0000,003D,0180,0800,0000,1219 :2718 ERROR1 ; NO TRAP OCCURRED.
U 100A, 0000,003D,0180,0800,0000,1219 :2719 ERROR1 ; UTRAPPED BUT NOT TB MISS TRAP.
U 100B, 0000,003C,0180,0000,0000,1342 :2720 FS/MCT,MCT/TEST.RCHK ; TEST BEN/TB.TEST
U 1342, 0000,1D3C,0180,0800,0000,10DC :2721 BEN/TB.TEST ; TEST INSTRUCTION FOR BRANCH TB.TEST
U 10DC, 0000,003D,0180,0800,0000,1219 :2722 =11100 ERROR1 ; BRANCH WENT TO WRONG ADDRESS
U 10DD, 0000,003D,0180,0800,0000,1219 :2723 ERROR1
U 10DE, 0000,003D,0180,0800,0000,1219 :2724 ERROR1
U 10DF, 0000,003C,0180,0800,0000,1343 :2725 NOP
:2726 :////////////////////
:2727 : [8] READ
:2728 : VA=33330000
:2729 : CHECK FOR HIT IN GROUP 0
:2730 : AND CHECK RELOCATED ADDRESS (AS IT APPEARS IN THE TIME OUT ADDRESS
:2731 : REGISTER:
:2732 : 05555500
:2733 :
U 1343, 0010,0038,0180,0938,0200,1344 :2734 VA RC[7] ; RC[7]=33330000
U 1344, 0010,0038,0180,09D0,0000,1345 :2735 RC[0A]_LC
U 1345, 0000,003C,0180,0940,0000,1090 :2736 LC RC[8] ; RC[8]=05555500
U 1090, 0010,0039,0180,0AB8,0000,124C :2737 =000 R[7]_LC,CALL,J/HIT0 ; HIT0 CHECKS THE GROUP 0 HIT
U 1091, 0000,003D,0180,0800,0000,1219 :2738 ERROR1 ; A NON TB MISS UTRAP OCCURRED
U 1092, 0000,003D,0180,0800,0000,1219 :2739 ERROR1 ; A TB MISS UTRAP OCCURRED
U 1093, 0000,003D,0180,0800,0000,1219 :2740 ERROR1 ; NO UTRAP BUT HIT/MISS BIT INCORRECT
U 1094, 0000,003D,0180,0800,0000,1232 :2741 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1095, 0000,003D,0180,0800,0000,1219 :2742 ERROR1 ; A UTRAP OCCURRED
U 1096, 0000,003D,0180,0800,0000,1219 :2743 ERROR1 ; RELOCATION INCORRECT
U 1097, 0000,003C,0180,0800,0000,1346 :2744 NOP
:2745 :////////////////////
:2746 : [9] READ
:2747 : VA=55554000
:2748 : CHECK FOR HIT IN GROUP 1 AND CHECK THE RELOCATED
:2749 : ADDRESS (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER).
:2750 : 0CCCC80
:2751 :
U 1346, 0010,0038,0180,0920,0200,1347 :2752 VA RC[4] ; RC[4]=55554000
U 1347, 0010,0038,0180,09D0,0000,1348 :2753 RC[0A]_LC
U 1348, 0000,003C,0180,0928,0000,10A0 :2754 LC RC[5] ; RC[5]=0CCCC80
U 10A0, 0010,0039,0180,0AB8,0000,1258 :2755 =000 R[7]_LC,CALL,J/HIT1 ; HIT1 CHECKS FOR A HIT IN GROUP 1
U 10A1, 0000,003D,0180,0800,0000,1219 :2756 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 10A2, 0000,003D,0180,0800,0000,1219 :2757 ERROR1 ; A TB MISS TRAP OCCURRED.
U 10A3, 0000,003D,0180,0800,0000,1219 :2758 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10A4, 0000,003D,0180,0800,0000,1232 :2759 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 10A5, 0000,003D,0180,0800,0000,1219 :2760 ERROR1 ; A TRAP OCCURRED.
U 10A6, 0000,003D,0180,0800,0000,1219 :2761 ERROR1 ; NO UTRAP BUT RELOCATION INCORRECT.
U 10A7, 0000,003C,0180,0800,0000,1349 :2762 NOP
:2763 :////////////////////
:2764 : [A] WRITE INTO GROUP 1:
:2765 : VA=2AAA8000

```

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:2766 :
:2767 :
:2768 :
U 1349, 0000,003C,0180,0A08,0200,134A :2769 :
U 134A, 0000,003C,0180,09D0,0000,134B :2770 :
U 134B, 0000,003C,0180,0A00,0000,11C4 :2771 :
U 11C4, 0000,003D,0180,0AC0,0000,1024 :2772 =0 :
U 11C5, 0000,003C,0580,0800,0084,734C :2773 :
U 134C, 0003,001C,0180,09F0,0000,134D :2774 :
U 134D, 0001,2024,0180,0800,0010,134E :2775 :
U 134E, 0000,013C,0180,0800,0000,11C6 :2776 :
U 11C6, 0000,003C,0180,0800,0000,134F :2777 =0 :
U 11C7, 0001,203D,0180,09E8,0000,1219 :2778 :
:2779 :
:2780 :
:2781 :
U 134F, 0010,0038,0180,0920,0200,1010 :2782 :
U 1010, 0010,0039,0180,09D0,0000,1242 :2783 :
U 1011, 0000,003D,0180,0800,0000,1219 :2784 :
U 1012, 0000,003D,0180,0800,0000,1219 :2785 :
U 1013, 0000,003C,0180,0000,0000,1350 :2786 :
U 1350, 0000,1D3C,0180,0800,0000,10FC :2787 :
U 10FC, 0000,003D,0180,0800,0000,1219 :2788 :
U 10FD, 0000,003D,0180,0800,0000,1219 :2789 :
U 10FE, 0000,003D,0180,0800,0000,1219 :2790 :
U 10FF, 0000,003C,0180,0800,0000,1351 :2791 :
:2792 :
:2793 :
:2794 :
:2795 :
:2796 :
:2797 :
:2798 :
U 1351, 0010,0038,0180,0938,0200,1352 :2799 :
U 1352, 0010,0038,0180,09D0,0000,1353 :2800 :
U 1353, 0000,003C,0180,0940,0000,10A8 :2801 :
U 10A8, 0010,0039,0180,0A88,0000,124C :2802 =000 :
U 10A9, 0000,003D,0180,0800,0000,1219 :2803 :
U 10AA, 0000,003D,0180,0800,0000,1219 :2804 :
U 10AB, 0000,003D,0180,0800,0000,1219 :2805 :
U 10AC, 0000,003D,0180,0800,0000,1232 :2806 :
U 10AD, 0000,003D,0180,0800,0000,1219 :2807 :
U 10AE, 0000,003D,0180,0800,0000,1219 :2808 :
U 10AF, 0000,003C,0180,0800,0000,1354 :2809 :
:2810 :
:2811 :
:2812 :
:2813 :
:2814 :
:2815 :
:2816 :
U 1354, 0000,003C,0180,0A08,0200,1355 :2817 :
U 1355, 0000,003C,0180,09D0,0000,1356 :2818 :
U 1356, 0000,003C,0180,0A10,0000,1080 :2819 :
U 1080, 0000,003D,0180,0A88,0000,1258 :2820 :

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PTE=A4066666
AND CHECK WRITE PULSE IN TBERO

VA R[1] : R[1]=2AAA8000
RC[0A] LA
LAB R[0] : R[0]=A4066666
R[8] LA,CALL,J/TBWR1 : WRITE INTO GROUP 1
SC K[6] : CHECK THE WRITE PULSE BIT IN TBERO
ALU NOT.MASK,RC[0E] ALU
ALU_Q.ANDNOT.MASK,C[K.UBCC
Z?
J/TBWPC
ERROR1,RC[0D] Q : TBERO WRITE PULSE BIT INCORRECT
//////////
[B] READ VA=55554000 AND CHECK FOR MISS IN BOTH GROUPS
:2781 :
TBWPC: VA RC[4] : RC[4]=55554000
=00 RC[0A] LC,CALL,J/MISS : CHECK MISS IN BOTH GROUPS
ERROR1 : NO TRAP OCCURRED.
ERROR1 : UTRAPPED BUT NOT TB MISS TRAP.
FS/MCT,MCT/TEST.RCHK : CHECK TB.TEST BRANCH
BEN/TB.TEST : TEST INSTRUCTION
=11100 ERROR1 : BRANCH WENT TO WRONG ADDRESS
ERROR1
ERROR1
NOP
//////////
[C] READ
VA=33330000
CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT APPEARS
IN THE TIME OUT ADDRESS REGISTER)
05555500
:2799 :
VA RC[7] : RC[7]=33330000
RC[0A] LC
LC RC[8] : RC[8]=05555500
R[7] LC,CALL,J/HITO : CHECK THE HIT IN GROUP 0
=000 ERROR1 : A NON TB MISS TRAP OCCURRED.
ERROR1 : A TB MISS TRAP OCCURRED.
ERROR1 : NO TRAP BUT HIT/MISS BIT NOT SET.
CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
ERROR1 : A TRAP OCCURRED.
ERROR1 : NO UTRAP BUT RELOCATION INCORRECT.
NOP
//////////
[D] READ
VA=2AAA8000
CHECK THE HIT IN GROUP 1 AND THE RELOCATED ADDRESS (AS IT
APPEARS IN THE TIME OUT ADDRESS REGISTER):
03333300
:2817 :
VA R[1] : R[1]=2AAA8000
RC[0A] LA
LAB R[2] : R[2]=03333300
R[7] LA,CALL,J/HIT1 : CHECK THE GROUP 1 HIT
=000

```

U 10B1, 0000,003D,0180,0800,0000,1219 :2821
U 10B2, 0000,003D,0180,0800,0000,1219 :2822
U 10B3, 0000,003D,0180,0800,0000,1219 :2823
U 10B4, 0000,003D,0180,0800,0000,1232 :2824
U 10B5, 0000,003D,0180,0800,0000,1219 :2825
U 10B6, 0000,003D,0180,0800,0000,1219 :2826
U 10B7, 0000,003C,0180,0800,0000,1357 :2827

U 1357, 0010,0038,0180,0908,0200,1358 :2833
U 1358, 0010,0038,0180,09D0,0000,1359 :2834
U 1359, 0000,003C,0180,0900,0000,11C8 :2835
U 11C8, 0010,0039,0180,0AC0,0000,1044 :2836
U 11C9, 0000,003C,0180,0800,0000,135A :2837

U 135A, 0010,0038,0180,0938,0200,1018 :2843
U 1018, 0010,0039,0180,09D0,0000,1242 :2844
U 1019, 0000,003D,0180,0800,0000,1219 :2845
U 101A, 0000,003D,0180,0800,0000,1219 :2846
U 101B, 0000,003C,0180,0800,0000,135B :2847

U 135B, 0000,003C,0180,0A08,0200,1020 :2853
U 1020, 0000,003D,0180,09D0,0000,1242 :2854
U 1021, 0000,003D,0180,0800,0000,1219 :2855
U 1022, 0000,003D,0180,0800,0000,1219 :2856
U 1023, 0000,003C,0180,0800,0000,135C :2857

U 135C, 0010,0038,0180,0908,0200,135D :2865
U 135D, 0010,0038,0180,09D0,0000,135E :2866
U 135E, 0000,003C,0180,0910,0000,10C0 :2867
U 10C0, 0010,0039,0180,0AB8,0000,124C :2868
U 10C1, 0000,003D,0180,0800,0000,1219 :2869
U 10C2, 0000,003D,0180,0800,0000,1219 :2870
U 10C3, 0000,003D,0180,0800,0000,1219 :2871
U 10C4, 0000,003D,0180,0800,0000,1232 :2872
U 10C5, 0000,003D,0180,0800,0000,1219 :2873
U 10C6, 0000,003D,0180,0800,0000,1219 :2874
U 10C7, 0000,003C,0180,0800,0000,135F :2875

```

ERROR1      : A NON TB MISS TRAP OCCURRED.
ERROR1      : A TB MISS TRAP OCCURRED.
ERROR1      : NO TRAP BUT HIT/MISS BIT NOT SET.
CALL,J/RELCHK      : CHECK THE RELOCATED ADDRESS
ERROR1      : A TRAP OCCURRED.
ERROR1      : NO UTRAP BUT RELOCATION INCORRECT.
NOP

////////////////////
[E] WRITE INTO BOTH GROUPS:
      VA=4CCCC000
      PTE=A4155555
:
      VA_RC[1]      : RC[1]=4CCCC000
      RC[0A]_LC
      LC_RC[0]      : RC[0]=A4155555
=0      R[8]_LC,CALL,J/TBWRB      : WRITE BOTH GROUPS
      NOP

////////////////////
[F] READ
      VA=33330000
      AND CHECK FOR MISS IN BOTH GROUPS
TBWPD:  VA_RC[7]      : RC[7]=33330000
=00     RC[0A]_LC,CALL,J/MISS      : CHECK FOR TB MISS
      ERROR1      : NO TRAP OCCURRED.
      ERROR1      : UTRAPPED BUT NOT TB MISS TRAP.
      NOP

////////////////////
[10] READ
      VA=2AAA8000
      AND CHECK FOR MISS IN BOTH GROUPS
=00     VA_RC[1]      : RC[1]=2AAA8000
      RC[0A]_LA,CALL,J/MISS      : READ MISS IN BOTH GROUPS
      ERROR1      : NO TRAP OCCURRED.
      ERROR1      : UTRAPPED BUT NOT TB MISS TRAP.
      NOP

////////////////////
[11] READ
      VA=4CCCC000
      CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT APPEARS
      IN THE TIME OUT ADDRESS REGISTER)
      OAAAAA80
:
      VA_RC[1]      : RC[1]=4CCCC000
      RC[0A]_LC
      LC_RC[2]      : RC[2]=0AAAAA80
=000    R[7]_LC,CALL,J/HITO      : CHECK GROUP 0 HIT
      ERROR1      : A NON TB MISS TRAP OCCURRED.
      ERROR1      : A TB MISS TRAP OCCURRED.
      ERROR1      : NO TRAP BUT HIT/MISS BIT NOT SET.
      CALL,J/RELCHK      : CHECK RELOCATED ADDRESS
      ERROR1      : A TRAP OCCURRED.
      ERROR1      : NO UTRAP BUT RELOCATION INCORRECT.
      NOP

```



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:2876 :////////////////////////
:2877 : [12] WRITE INTO GROUP 0
:2878 :         VA=33330000
:2879 :         PTE=A40AAAAA
:2880 :
:2881 :         VA RC[7] : RC[7]=33330000
:2882 :         RC[0A] LC
:2883 :         LC RC[6] : RC[6]=A40AAAAA
:2884 :         R[8] LC,CALL,J/TBWRO : WRITE GROUP 0
:2885 :         SC K[6] : TEST WRITE PULSE BIT IN TBERO
:2886 :         RC[0E] 0
:2887 :         ALU_Q.ANDNOT.MASK,CLK.UBCC
:2888 :         Z?
:2889 :         =0 ERROR1,RC[0D] 0 : TBERO WRITE PULSE BIT INCORRECT
:2890 :         //////////////////
:2891 : [13] READ
:2892 :         VA=4CCCC000
:2893 :         CHECK FOR HIT IN GROUP 1 AND RELOCATED ADDRESS (AS IT APPEARS
:2894 :         IN THE TIME OUT ADDRESS REGISTER)
:2895 :         OAAAAA80
:2896 :
:2897 :         TBWPX: VA RC[1] : RC[1]=4CCCC000
:2898 :         RC[0A] LC
:2899 :         LC RC[2] : RC[2]=OAAAAA80
:2900 :         =000 R[7] LC,CALL,J/HIT1 : CHECK FOR GROUP 1 HIT
:2901 :         ERROR1 : A NON TB MISS TRAP OCCURRED.
:2902 :         ERROR1 : A TB MISS TRAP OCCURRED.
:2903 :         ERROR1 : NO TRAP BUT HIT/MISS BIT NOT SET.
:2904 :         CALL,J/RELCHK : CHECK FOR RELOCATED ADDRESS
:2905 :         ERROR1 : A TRAP OCCURRED.
:2906 :         ERROR1 : NO UTRAP BUT RELOCATION INCORRECT.
:2907 :         NOP
:2908 :         //////////////////
:2909 : [14] READ
:2910 :         VA=33330000
:2911 :         CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT
:2912 :         APPEARS IN THE TIME OUT ADDRESS REGISTER)
:2913 :         05555500
:2914 :
:2915 :         VA RC[7] : RC[7]=33330000
:2916 :         RC[0A] LC
:2917 :         LC RC[8] : RC[8]=05555500
:2918 :         =000 R[7] LC,CALL,J/HITO : CHECK FOR HIT IN GROUP 0
:2919 :         ERROR1 : A NON TB MISS TRAP OCCURRED.
:2920 :         ERROR1 : A TB MISS TRAP OCCURRED.
:2921 :         ERROR1 : NO TRAP BUT HIT/MISS BIT NOT SET.
:2922 :         CALL,J/RELCHK : CHECK FOR RELOCATED ADDRESS
:2923 :         ERROR1 : A TRAP OCCURRED.
:2924 :         ERROR1 : NO UTRAP BUT RELOCATION INCORRECT.
:2925 :         NOP
:2926 :         //////////////////
:2927 : [15] WRITE INTO A RANDOM TB GROUP
:2928 :         VA=55554000
:2929 :         PTE=A4199999
:2930 :

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U 135F, 0010,0038,0180,0938,0200,1360
U 1360, 0010,0038,0180,09D0,0000,1361
U 1361, 0000,003C,0180,0930,0000,11CA
U 11CA, 0010,0039,0180,0AC0,0000,103C
U 11CB, 0000,003C,0580,0800,0084,7362
U 1362, 0003,003C,0180,09F0,0000,1363
U 1363, 0001,2024,0180,0800,0010,1364
U 1364, 0000,013C,0180,0800,0000,11CC
U 11CC, 0001,203D,0180,09E8,0000,1219

U 11CD, 0010,0038,0180,0908,0200,1365
U 1365, 0010,0038,0180,09D0,0000,1366
U 1366, 0000,003C,0180,0910,0000,10C8
U 10C8, 0010,0039,0180,0AB8,0000,1258
U 10C9, 0000,003D,0180,0800,0000,1219
U 10CA, 0000,003D,0180,0800,0000,1219
U 10CB, 0000,003D,0180,0800,0000,1219
U 10CC, 0000,003D,0180,0800,0000,1232
U 10CD, 0000,003D,0180,0800,0000,1219
U 10CE, 0000,003D,0180,0800,0000,1219
U 10CF, 0000,003C,0180,0800,0000,1367

U 1367, 0010,0038,0180,0938,0200,1368
U 1368, 0010,0038,0180,09D0,0000,1369
U 1369, 0000,003C,0180,0940,0000,10D0
U 10D0, 0010,0039,0180,0AB8,0000,124C
U 10D1, 0000,003D,0180,0800,0000,1219
U 10D2, 0000,003D,0180,0800,0000,1219
U 10D3, 0000,003D,0180,0800,0000,1219
U 10D4, 0000,003D,0180,0800,0000,1232
U 10D5, 0000,003D,0180,0800,0000,1219
U 10D6, 0000,003D,0180,0800,0000,1219
U 10D7, 0000,003C,0180,0800,0000,136A


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U 136A, 0010,0038,0180,0920,0200,136B :2931
U 136B, 0010,0038,0180,09D0,0000,136C :2932
U 136C, 0000,003C,0180,0918,0000,11CE :2933
U 11CE, 0010,0039,0180,0AC0,0000,122E :2934
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U 11CF, 0000,003C,0180,0A08,0200,136D :2942
U 136D, 0000,003C,0180,0A00,0000,11D0 :2943
U 11D0, 0000,003D,0180,0AC0,0000,122E :2944
U 11D1, 0001,203C,0180,0A98,0000,136E :2945

U 136E, 0010,0038,0180,0908,0200,1028 :2953
U 1028, 0010,0039,0180,09D0,0000,1242 :2954
U 1029, 0000,003D,0180,0800,0000,1219 :2955
U 102A, 0000,003D,0180,0800,0000,1219 :2956
U 102B, 0000,003C,0180,0800,0000,136F :2957

U 136F, 0010,0038,0180,0938,0200,1030 :2961
U 1030, 0010,0039,0180,09D0,0000,1242 :2962
U 1031, 0000,003D,0180,0800,0000,1219 :2963
U 1032, 0000,003D,0180,0800,0000,1219 :2964
U 1033, 0000,003C,0180,0800,0000,1370 :2965

U 1370, 0000,003C,01C0,0A18,0000,1371 :2973
U 1371, 0000,003C,D580,0800,0084,7372 :2974
U 1372, 0001,2024,0180,0800,0010,1373 :2975
U 1373, 0000,013C,0180,0800,0000,11D2 :2976
U 11D2, 0000,003C,0180,0800,0000,137A :2977
U 11D3, 0000,003C,0180,0800,0000,1374 :2978

VA RC[4] : RC[4]=55554000
RC[0A]_LC
LC RC[3] : RC[3]=A4199999
R[8]_LC,CALL,J/TBWAN : PERFORM WRITE RANDOM FUNCTION
=====
[16] WRITE INTO A RANDOM TB GROUP
VA=2AAA8000
PTE=A4066666
NOTE THIS WRITE SHOULD BE INTO A DIFFERENT
GROUP THAN THE GROUP WHICH WAS WRITTEN INTO BY STEP 21. ABOVE

VA R[1] : R[1]=2AAA8000
LAB R[0] : R[0]=A4066666
R[8]_LA,CALL,J/TBWAN : WRITE INTO TB RANDOMLY
R[3]_Q : SAVE CONTENTS OF TBERO
: SO THAT WRITE PULSE BIT CAN BE
: USED TO DETERMINE WHICH GROUP
: WAS WRITTEN WITH WHICH DATA
: PATTERNS.
=====
READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS

VA RC[1] : RC[1]=4CCCC000
RC[0A]_LC,CALL,J/MISS : CHECK FOR MISS IN BOTH GROUPS
ERROR1 : NO TRAP OCCURRED.
ERROR1 : UTRAPPED BUT NOT TB MISS TRAP.
NOP

=====
READ VA=33330000 AND CHECK FOR MISS IN BOTH GROUPS

VA RC[7] : RC[7]=33330000
RC[0A]_LC,CALL,J/MISS : READ MISS IN BOTH GROUPS
ERROR1 : NO TRAP OCCURRED.
ERROR1 : UTRAPPED BUT NOT TB MISS TRAP.
NOP

=====
[17]
[18]

FIRST DETERMINE WHICH GROUP GOT WRITTEN WITH WHICH DATA PATTERN
AND THEN CHECK THE TWO HITS AND TWO RELOCATED ADDRESSES.

Q R[3] : CHECK SAVED COPY OF TBERO
SC K[.6]
ALD_Q.ANDNOT.MASK,CLK.UBCC
Z?
J/TBWPF
NOP

=====
FIRST WRITE WENT TO GROUP 1, SECOND TO GROUP 0

READ
VA=2AAA8000
CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS
03333300

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:2986
U 1374, 0000,003C,0180,0A08,0200,1375 :2987
U 1375, 0000,003C,0180,09D0,0000,1376 :2988
U 1376, 0000,003C,0180,0A10,0000,10E0 :2989
U 10E0, 0000,003D,0180,0AB8,0000,124C :2990
U 10E1, 0000,003D,0180,0800,0000,1219 :2991
U 10E2, 0000,003D,0180,0800,0000,1219 :2992
U 10E3, 0000,003D,0180,0800,0000,1219 :2993
U 10E4, 0000,003D,0180,0800,0000,1232 :2994
U 10E5, 0000,003D,0180,0800,0000,1219 :2995
U 10E6, 0000,003D,0180,0800,0000,1219 :2996
U 10E7, 0000,003C,0180,0800,0000,1377 :2997
:2998
:2999
:3000
:3001
U 1377, 0010,0038,0180,0920,0200,1378 :3002
U 1378, 0010,0038,0180,09D0,0000,1379 :3003
U 1379, 0000,003C,0180,0928,0000,10E8 :3004
U 10E8, 0010,0039,0180,0AB8,0000,1258 :3005
U 10E9, 0000,003D,0180,0800,0000,1219 :3006
U 10EA, 0000,003D,0180,0800,0000,1219 :3007
U 10EB, 0000,003D,0180,0800,0000,1219 :3008
J 10EC, 0000,003D,0180,0800,0000,1232 :3009
U 10ED, 0000,003D,0180,0800,0000,1219 :3010
U 10EE, 0000,003D,0180,0800,0000,1219 :3011
U 10EF, 0000,003C,0180,0800,0000,1117 :3012
:3013
:3014
:3015
:3016
:3017
:3018
:3019
:3020
U 137A, 0000,003C,0180,0A08,0200,137B :3021
U 137B, 0000,003C,0180,09D0,0000,137C :3022
U 137C, 0000,003C,0180,0A10,0000,10F0 :3023
U 10F0, 0000,003D,0180,0AB8,0000,1258 :3024
U 10F1, 0000,003D,0180,0800,0000,1219 :3025
U 10F2, 0000,003D,0180,0800,0000,1219 :3026
U 10F3, 0000,003D,0180,0800,0000,1219 :3027
U 10F4, 0000,003D,0180,0800,0000,1232 :3028
U 10F5, 0000,003D,0180,0800,0000,1219 :3029
U 10F6, 0000,003D,0180,0800,0000,1219 :3030
U 10F7, 0000,003C,0180,0800,0000,137D :3031
:3032
:3033
:3034
:3035
:3036
U 137D, 0010,0038,0180,0920,0200,137E :3037
U 137E, 0010,0038,0180,09D0,0000,137F :3038
U 137F, 0000,003C,0180,0928,0000,1110 :3039
U 1110, 0010,0039,0180,0AB8,0000,124C :3040

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:
VA R[1] ; R[1]=2AAA8000
RC[0A] LA
LAB R[2] ; R[2]=03333300
R[7] LA,CALL,J/HIT0 ; CHECK GROUP 0 HIT
ERROR1 ; A NON TB MISS TRAP OCCURRED.
ERROR1 ; A TB MISS TRAP OCCURRED.
ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
ERROR1 ; A TRAP OCCURRED.
ERROR1 ; NO UTRAP BUT RELOCATION INCORRECT.
NOP
READ
VA=55554000
CHECK THE HIT IN GROUP 1 AND THE RELOCATED ADDRESS
0CCCCC80
VA R[4] ; R[4]=55554000
RC[0A] LC
LC R[5] ; R[5]=0CCCCC80
R[7] LC,CALL,J/HIT1 ; CHECK THE GROUP 1 HIT
ERROR1 ; A NON TB MISS TRAP OCCURRED.
ERROR1 ; A TB MISS TRAP OCCURRED.
ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
ERROR1 ; A TRAP OCCURRED.
ERROR1 ; NO UTRAP BUT RELOCATION INCORRECT.
J/TBWP
////////////////////
THE FIRST WRITE WENT TO GROUP 0, THE SECOND TO GROUP 1.
READ
VA=2AAA8000
CHECK FOR HIT IN GROUP 1 AND RELOCATED ADDRESS
03333300
TBWPF: VA R[1] ; R[1]=2AAA8000
RC[0A] LA
LAB R[2] ; R[2]=03333300
R[7] LA,CALL,J/HIT1 ; CHECK FOR HIT IN GROUP 1
ERROR1 ; A NON TB MISS TRAP OCCURRED.
ERROR1 ; A TB MISS TRAP OCCURRED.
ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
ERROR1 ; A TRAP OCCURRED.
ERROR1 ; NO UTRAP BUT RELOCATION INCORRECT.
NOP
READ
VA=55554000
CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS
0CCCCC80
VA R[4] ; R[4]=55554000
RC[0A] LC
LC R[5] ; R[5]=0CCCCC80
R[7] LC,CALL,J/HIT0 ; CHECK FOR HIT IN GROUP 0

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U 1111, 0000,003D,0180,0800,0000,1219 :3041      ERROR1      : A NON TB MISS TRAP OCCURRED.
U 1112, 0000,003D,0180,0800,0000,1219 :3042      ERROR1      : A TB MISS TRAP OCCURRED.
U 1113, 0000,003D,0180,0800,0000,1219 :3043      ERROR1      : NO TRAP BUT HIT/MISS BIT NOT SET.
U 1114, 0000,003D,0180,0800,0000,1232 :3044      CALL,J/RELCHK : CHECK RELOCATED ADDRESS
U 1115, 0000,003D,0180,0800,0000,1219 :3045      ERROR1      : A TRAP OCCURRED.
U 1116, 0000,003D,0180,0800,0000,1219 :3046      ERROR1      : NO UTRAP BUT RELOCATION INCORRECT.
U 1117, 0000,003C,0180,0800,0000,11D4 :3047      TBWPG: NOP
:3048      ://///////////////
:3049      [19] WRITE INTO GROUP 1
:3050      VA=4CCCC000
:3051      PTE=A4155555
:3052
U 11D4, 0000,003D,0180,0800,0000,1218 :3053      =0      ERLOOP
U 11D5, 0010,0038,0180,0908,0200,1380 :3054      VA_RC[1]      : RC[1]=4CCCC000
U 1380, 0000,003C,0180,0900,0000,11D6 :3055      LC_RC[0]      : RC[0]=A4155555
U 11D6, 0010,0039,0180,0AC0,0000,1024 :3056      =0      R[8] LC,CALL,J/TBWR1 : WRITE INTO GROUP 1
:3057      ://///////////////
:3058      [1A] WRITE INTO GROUP 0
:3059      VA=33330000
:3060      PTE=A40AAAAA
:3061
U 11D7, 0010,0038,0180,0938,0200,1381 :3062      VA_RC[7]      : RC[7]=33330000
U 1381, 0000,003C,0180,0930,0000,11D8 :3063      LC_RC[6]      : RC[6]=A40AAAAA
U 11D8, 0010,0039,0180,0AC0,0000,103C :3064      =0      R[8] LC,CALL,J/TBWRO : WRITE INTO GROUP 0
:3065      ://///////////////
:3066      [1B] WRITE
:3067      VA=4CCCC000
:3068      PTE=A4199999
:3069      4CCCC000 IS A HIT IN GROUP 1 SO GROUP 1 SHOULD BE WRITTEN
:3070      EVEN IF THE FORCE REPLACE GROUP 0 BIT IS SET.
:3071
U 11D9, 0010,0038,0180,0908,0200,1382 :3072      VA_RC[1]      : RC[1]=4CCCC000
U 1382, 0000,003C,0180,0918,0000,11DA :3073      LC_RC[3]      : RC[3]=A4199999
U 11DA, 0010,0039,0180,0AC0,0000,103C :3074      =0      R[8] LC,CALL,J/TBWRO : THIS SHOULD WRITE ONLY GROUP 1
:3075      ://///////////////
:3076      [1C] READ
:3077      VA=33330000
:3078      CHECK FOR HIT IN GROUP 0 AND CHECK
:3079      THE RELOCATED ADDRESS
:3080      05555500
:3081
U 11DB, 0010,0038,0180,0938,0200,1383 :3082      VA_RC[7]      : RC[7]=33330000
U 1383, 0010,0038,0180,09D0,0000,1384 :3083      RC[0A] LC
U 1384, 0000,003C,0180,0940,0000,1118 :3084      LC_RC[8]      : RC[8]=05555500
U 1118, 0010,0039,0180,0AB8,0000,124C :3085      =000      R[7] LC,CALL,J/HITO : CHECK FOR A HIT IN GROUP 0
U 1119, 0000,003D,0180,0800,0000,1219 :3086      ERROR1      : A NON TB MISS TRAP OCCURRED.
U 111A, 0000,003D,0180,0800,0000,1219 :3087      ERROR1      : A TB MISS TRAP OCCURRED.
U 111B, 0000,003D,0180,0800,0000,1219 :3088      ERROR1      : NO TRAP BUT HIT/MISS BIT NOT SET.
U 111C, 0000,003D,0180,0800,0000,1232 :3089      CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
U 111D, 0000,003D,0180,0800,0000,1219 :3090      ERROR1      : A TRAP OCCURRED.
U 111E, 0000,003D,0180,0800,0000,1219 :3091      ERROR1      : NO UTRAP BUT RELOCATION INCORRECT.
U 111F, 0000,003C,0180,0800,0000,1385 :3092      NOP
:3093      ://///////////////
:3094      [1D] READ
:3095      VA=4CCCC000

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:3096 : CHECK FOR A HIT IN GROUP 1 AND CHECK THE
:3097 : RELOCATED ADDRESS
:3098 : 0CCCC800
:3099 :
U 1385, 0010,0038,0180,0908,0200,1386 :3100 VA RC[1] : RC[1]=4CCCC000
U 1386, 0010,0038,0180,09D0,0000,1387 :3101 RC[0A] LC
U 1387, 0000,003C,0180,0928,0000,1120 :3102 LC RC[5] : RC[5]=0CCCC800
U 1120, 0010,0039,0180,0AB8,0000,1258 :3103 =000 R[7] LC,CALL,J/HIT1 : CHECK FOR A HIT IN GROUP 1
U 1121, 0000,003D,0180,0800,0000,1219 :3104 ERROR1 : A NON TB MISS TRAP OCCURRED.
U 1122, 0000,003D,0180,0800,0000,1219 :3105 ERROR1 : A TB MISS TRAP OCCURRED.
U 1123, 0000,003D,0180,0800,0000,1219 :3106 ERROR1 : NO TRAP BUT HIT/MISS BIT NOT SET.
U 1124, 0000,003D,0180,0800,0000,1232 :3107 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
U 1125, 0000,003D,0180,0800,0000,1219 :3108 ERROR1 : A TRAP OCCURRED.
U 1126, 0000,003D,0180,0800,0000,1219 :3109 ERROR1 : NO UTRAP BUT RELOCATION INCORRECT.
U 1127, 0000,003C,0180,0800,0000,1388 :3110 NOP
:3111 : //////////////////////////////////////
:3112 : [1E] WRITE
:3113 : VA=33330000
:3114 : PTE=A4066666
:3115 : 33330000 IS A HIT IN GROUP 0 SO THIS SHOULD WRITE INTO
:3116 : GROUP 0 EVEN IF THE REPLACE GROUP 1 BIT IS SET.
:3117 :
U 1388, 0010,0038,0180,0938,0200,1389 :3118 VA RC[7] : RC[7]=3333000
U 1389, 0000,003C,0180,0A00,0000,11DC :3119 LAB RC[0] : RC[0]=A4066666
U 11DC, 0000,003D,0180,0AC0,0000,1024 :3120 =0 R[8] LA,CALL,J/TBWR1 : SHOULD WRITE ONLY GROUP 0
U 11DD, 0000,003C,0180,0800,0000,138A :3121 NOP
:3122 : //////////////////////////////////////
:3123 : [1F] READ
:3124 : VA=4CCCC000
:3125 : CHECK FOR HIT IN GROUP 1 AND CHECK FOR RELOCATED ADDRESS
:3126 : 0CCCC800
:3127 :
U 138A, 0010,0038,0180,0908,0200,138B :3128 VA RC[1] : RC[1]=4CCCC000
U 138B, 0010,0038,0180,09D0,0000,138C :3129 RC[0A] LC
U 138C, 0000,003C,0180,0928,0000,1128 :3130 LC RC[5] : RC[5]=0CCCC800
U 1128, 0010,0039,0180,0AB8,0000,1258 :3131 =000 R[7] LC,CALL,J/HIT1 : CHECK FOR HIT IN GROUP 1
U 1129, 0000,003D,0180,0800,0000,1219 :3132 ERROR1 : A NON TB MISS TRAP OCCURRED.
U 112A, 0000,003D,0180,0800,0000,1219 :3133 ERROR1 : A TB MISS TRAP OCCURRED.
U 112B, 0000,003D,0180,0800,0000,1219 :3134 ERROR1 : NO TRAP BUT HIT/MISS BIT NOT SET.
U 112C, 0000,003D,0180,0800,0000,1232 :3135 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
U 112D, 0000,003D,0180,0800,0000,1219 :3136 ERROR1 : A UTRAP OCCURRED.
U 112E, 0000,003D,0180,0800,0000,1219 :3137 ERROR1 : NO UTRAP BUT RELOCATION IS INCORRECT.
U 112F, 0000,003C,0180,0800,0000,138D :3138 NOP
:3139 : //////////////////////////////////////
:3140 : [20] READ
:3141 : VA=33330000
:3142 : CHECK FOR HIT A GROUP 0 AND CHECK THE RELOCATED ADDRESS
:3143 : 03333300
:3144 :
U 138D, 0010,0038,0180,0938,0200,138E :3145 VA RC[7] : RC[7]=33330000
U 138E, 0010,0038,0180,09D0,0000,138F :3146 RC[0A] LC
U 138F, 0000,003C,0180,0A10,0000,1130 :3147 LAB RC[2] : RC[2]=03333300
U 1130, 0000,003D,0180,0AB8,0000,124C :3148 =000 R[7] LA,CALL,J/HITO : CHECK FOR HIT IN GROUP 0
U 1131, 0000,003D,0180,0800,0000,1219 :3149 ERROR1 : A NON TB MISS TRAP OCCURRED.
U 1132, 0000,003D,0180,0800,0000,1219 :3150 ERROR1 : A TB MISS TRAP OCCURRED.

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U 1133, 0000,003D,0180,0800,0000,1219 :3151      ERROR1      ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1134, 0000,003D,0180,0800,0000,1232 :3152      CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1135, 0000,003D,0180,0800,0000,1219 :3153      ERROR1      ; A UTRAP OCCURRED.
U 1136, 0000,003D,0180,0800,0000,1219 :3154      ERROR1      ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1137, 0000,003C,0180,0800,0000,11DE :3155      NOP
:3156      ;////////////////////////////////////
:3157      [21] SET THE FORCE MISS BIT FOR GROUP 0
:3158
:3159      =0      ERLOOP
:3160      SC KC.10]
:3161      ALD NOT.MASK,D_ALU      ; D=10000
:3162      D D+K[.1]      ; D=10001
:3163      ID[TBRO] D      ; SET FORCE MISS GROUP 0 BIT AND MME
:3164      ;////////////////////////////////////
:3165      [22] READ VA=33330000 AND CHECK FOR MISS IN BOTH GROUPS.
:3166
:3167      VA RC[7]      ; RC[7]=33330000
:3168      =00      RC[0A]_LC,CALL,J/MISS ; CHECK FOR TB MISS
:3169      ERROR1      ; NO TRAP OCCURRED.
:3170      ERROR1      ; UTRAPPED BUT NOT TB MISS TRAP.
:3171      NOP
:3172      ;////////////////////////////////////
:3173      [23] CLEAR THE FORCE MISSES IN GROUP 0 BIT
:3174
:3175      D KC.1]
:3176      ID[TBRO] D      ; SET JUST MME
:3177      ;////////////////////////////////////
:3178      [24] READ
:3179      VA=33330000
:3180      CHECK FOR HIT INGROUP 0 AND CHECK THE RELOCATED ADDRESS
:3181      03333300
:3182
:3183      VA RC[7]      ; RC[7]=33330000
:3184      RC[0A]_LC
:3185      LAB RC[2]      ; RC[2]=03333300
:3186      =000      RC[7] LA,CALL,J/HITO ; CHECK FOR A HIT IN GROUP 0
:3187      ERROR1      ; A NON TB MISS TRAP OCCURRED.
:3188      ERROR1      ; A TB MISS TRAP OCCURRED.
:3189      ERROR1      ; NO TRAP BUT HIT/MISS BIT NOT SET.
:3190      CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
:3191      ERROR1      ; A UTRAP OCCURRED.
:3192      ERROR1      ; NO UTRAP BUT RELOCATION IS INCORRECT.
:3193      NOP
:3194      ;////////////////////////////////////
:3195      [25] SET THE FORCE MISSES TO GROUP 1 BIT
:3196
:3197      =0      ERLOOP
:3198      D_K[.10]
:3199      D-D+K[.1],SC_ALU
:3200      ALU NOT.MASK,D_ALU      ; D=20000
:3201      D D+K[.1]      ; D=20001
:3202      ID[TBRO] D      ; SET FORCE MISSES TO GROUP 0 BIT AND MME
:3203      ;////////////////////////////////////
:3204      [26] READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS
:3205

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U 139D, 0010,0038,0180,0908,0200,1040 :3206
U 1040, 0010,0039,0180,09D0,0000,1242 :3207
U 1041, 0000,003D,0180,0800,0000,1219 :3208
U 1042, 0000,003D,0180,0800,0000,1219 :3209
U 1043, 0000,003C,0180,0800,0000,139E :3210
                                     :3211
                                     :3212
                                     :3213
U 139E, 0818,0038,0580,0800,0000,139F :3214
U 139F, 0000,003C,4980,3C00,0000,13A0 :3215
                                     :3216
                                     :3217
                                     :3218
                                     :3219
                                     :3220
U 13A0, 0010,0038,0180,0908,0200,13A1 :3221
U 13A1, 0010,0038,0180,09D0,0000,13A2 :3222
U 13A2, 0000,003C,0180,0928,0000,1140 :3223
U 1140, 0010,0039,0180,0A88,0000,1258 :3224
U 1141, 0000,003D,0180,0800,0000,1219 :3225
U 1142, 0000,003D,0180,0800,0000,1219 :3226
U 1143, 0000,003D,0180,0800,0000,1219 :3227
U 1144, 0000,003D,0180,0800,0000,1232 :3228
U 1145, 0000,003D,0180,0800,0000,1219 :3229
U 1146, 0000,003D,0180,0800,0000,1219 :3230
U 1147, 0000,003C,0180,0800,0000,11E2 :3231

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=00      VA RC[1]          ; RC[1]=4CCCC000
          RC[0A]_LC,CALL,J/MISS ; SHOULD BE A MISS IN TB
          ERROR1            ; NO TRAP OCCURRED.
          ERROR1            ; UTRAPPED BUT NOT TB MISS TRAP.
          NOP
          //////////////////////////////////
          [27] CLEAR THE FORCE MISSES IN GROUP 1 BIT
          :
          D_KC[1]
          ID[TERO]_D          ; SET JUST MME
          //////////////////////////////////
          [28] READ
          VA=4CCCC000
          CHECK FOR HIT IN GROUP 1 AND CHECK THE RELOCATED ADDRESS
          OCCCC800
          VA RC[1]          ; RC[1]=4CCCC000
          RC[0A]_LC
          LC RC[5]          ; RC[5]=OCCCC800
          R[7]_LC,CALL,J/HIT1 ; CHECK FOR HIT IN GROUP 1
          ERROR1            ; A NON TB MISS TRAP OCCURRED.
          ERROR1            ; A TB MISS TRAP OCCURRED.
          ERROR1            ; NO TRAP BUT HIT/MISS BIT NOT SET.
          CALL,J/RELCHK      ; CHECK THE RELOCATED ADDRESS
          ERROR1            ; A UTRAP OCCURRED.
          ERROR1            ; NO UTRAP BUT RELOCATION IS INCORRECT.
          NOP

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:3232 .PAGE "TEST A5 DATA PATH TO AND FROM DATA MEMORY TEST"
:3233 *****
:3234 ++
:3235 TEST A5 DATA PATH TO AND FROM DATA MEMORY TEST
:3236
:3237 TEST DESCRIPTION
:3238 THIS IS A TEST OF THE TB DATA MEMORY AT ONE LOCATION
:3239 IN EACH GROUP. THIS TEST FLOATS A ONE ACROSS A FIELD
:3240 OF 0'S AND A ZERO ACROSS A FIELD OF ONES. LOCATION ZERO
:3241 IS USED IN EACH GROUP.
:3242
:3243 ERROR DESCRIPTION
:3244 EXPECTED TBERO (IF CHECKING HIT/MISS BITS)
:3245 OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
:3246 ACTUAL TBERO
:3247 EXPECTED TIME OUT ADDRESS REGISTER
:3248 ACTUAL TIME OUT ADDRESS REGISTER
:3249 VA WRITTEN
:3250 UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
:3251 FLAG UTRAP TYPE
:3252 -----
:3253 DE NO UTRAP OCCURRED
:3254 SE TB PARITY ERROR
:3255 9E TB MISS
:3256 CE TB PROTECTION ERROR
:3257 D6 TB MODIFY BIT ERROR
:3258 DA X PAGE UTRAP
:3259 DC UNALIGNED DATA UTRAP
:3260
:3261 --
:3262 *****
:3263 =0
:3264 TBFLT: NEWTST
:3265 RC[0F],K[.6]
:3266 =0 CALL,J7CSOFF ; TURN OFF CACHE AND SBI
:3267 NOP
:3268 =0 D 0,CALL,J/DC.DE
:3269 RC[0E],D ; SET UP UTRAP FLAG, R[0E]=DE
:3270 =0 CALL,J/TBWPTP ; GENERATE SOME TEST PATTERNS
:3271 RC[4],K[.14] ; INITIAL A COUNTER
:3272 =0
:3273 TBFLT0: ERLOOP
:3274 SC K[C]
:3275 ALD NOT.MASK,D_ALU ; D=1000
:3276 ID[SBI.ERR],D ; UNLOCK THE TIME OUT ADDRESS REGISTER
:3277 VA RC[1] ; RC[1]=4CCCC000=VA
:3278 LC RC[0] ; RC[0]=A4155555, A PTE
:3279 =0 R[8],LC,CALL,J/TBWRB ; WRITE THIS VA AND PTE INTO BOTH GROUPS
:3280 SC R[4] ; GENERATE THE TEST PATTERN
:3281 Q R[0C] ; TO BE USED AS A PTE
:3282 ALU Q,ORNOT.MASK,Q_ALU
:3283 VA RC[7]
:3284 RC[0A],LC
:3285 R[5],LC
:3286 =0 R[6],Q,CALL,J/RELSUB ; GO GENERATE THE EXPECTED RESULT

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U 11E2, 0000,003D,0180,0800,0000,1076
U 11E3, 0018,0038,D580,09F8,0000,11E4
U 11E4, 0000,003D,0180,0800,0000,1222
U 11E5, 0000,003C,0180,0800,0000,11E6
U 11E6, 0F00,003D,0180,0800,0000,1014
U 11E7, 0001,003C,0180,0AF0,0000,11E8
U 11E8, 0000,003D,0180,0800,0000,1275
U 11E9, 0018,0038,2180,0AA0,0000,11EA

U 11EA, 0000,003D,0180,0800,0000,1218
U 11EB, 0000,003C,8580,0800,0084,73A3
U 13A3, 0803,001C,0180,0800,0000,13A4
U 13A4, 0000,003C,6580,3C00,0000,13A5
U 13A5, 0010,0038,0180,0908,0200,13A6
U 13A6, 0000,003C,0180,0900,0000,11EC
U 11EC, 0010,0039,0180,0AC0,0000,1044
U 11ED, 0000,003C,0180,0A20,0082,13A7
U 13A7, 0000,003C,01C0,0A60,0000,13A8
U 13A8, 0001,201C,01C0,0800,0000,13A9
U 13A9, 0010,0038,0180,0938,0200,13AA
U 13AA, 0010,0038,0180,09D0,0000,13AB
U 13AB, 0010,0038,0180,0AAB,0000,11EE
U 11EE, 0001,203D,0180,0AB0,0000,1048

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U 11EF, 0000,003C,01C0,0A30,0000,13AC :3287      Q R[6]           ; AS IT WOULD APPEAR IN A RELOCATED ADDRESS
U 13AC, 0001,203C,0180,0AC0,0000,11F0 :3288      R[8]_Q
U 11F0, 0000,003D,0180,0800,0000,103C :3289      CALL J/TBWRO      ; WRITE THIS PTE, WITH VA=33330000,
                                     : INTO GROUP 0
U 11F1, 0000,003C,0180,0800,0000,1148 :3290      NOP
U 1148, 0000,003D,0180,0800,0000,124C :3291      CALL J/HITO      ; NOW READ VA=33330000, CHECK FOR GROUP 0 HIT
U 1149, 0000,003D,0180,0800,0000,1219 :3292      ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 114A, 0000,003D,0180,0800,0000,1219 :3293      ERROR1          ; A TB MISS TRAP OCCURRED.
U 114B, 0000,003D,0180,0800,0000,1219 :3294      ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 114C, 0000,003D,0180,0800,0000,1232 :3295      CALL J/RELCHK      ; CHECK RELOCATED ADDRESS
U 114D, 0000,003D,0180,0800,0000,1219 :3296      ERROR1          ; A UTRAP OCCURRED.
U 114E, 0000,003D,0180,0800,0000,1219 :3297      ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 114F, 0000,003C,0180,0800,0000,13AD :3298      NOP
U 13AD, 0000,003C,0180,0A20,0082,13AE :3299      SC R[4]           ; NOW TRY THE COMPLIMENT TEST PATTERN
U 13AE, 0000,003C,01C0,0A68,0000,13AF :3300      Q R[0D]
U 13AF, 0001,2034,01C0,0A60,0000,11F2 :3301      ALU_Q.AND.MASK,Q_ALU,LAB R[0C]
U 11F2, 001C,0031,01C0,0AB0,0000,1048 :3302      ALU_LA[OR]Q,Q_ALU,R[6]_ALU,CALL J/RELSUB
U 11F3, 0000,003C,01C0,0A30,0000,13B0 :3303      Q R[6]
U 13B0, 0001,203C,0180,0AC0,0000,11F4 :3304      R[8]_Q
U 11F4, 0000,003D,0180,0800,0000,103C :3305      CALL J/TBWRO      ; WRITE THIS TEST PATTERN INTO GROUP 0
                                     : WITH VA=33330000
U 11F5, 0000,003C,0180,0800,0000,1158 :3306      NOP
U 1158, 0000,003D,0180,0800,0000,124C :3307      CALL J/HITO      ; READ VA=33330000, SHOULD HIT IN GROUP 0
U 1159, 0000,003D,0180,0800,0000,1219 :3308      ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 115A, 0000,003D,0180,0800,0000,1219 :3309      ERROR1          ; A TB MISS TRAP OCCURRED.
U 115B, 0000,003D,0180,0800,0000,1219 :3310      ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 115C, 0000,003D,0180,0800,0000,1232 :3311      CALL J/RELCHK      ; CHECK THE RELOCATED ADDRESS
U 115D, 0000,003D,0180,0800,0000,1219 :3312      ERROR1          ; A UTRAP OCCURRED.
U 115E, 0000,003D,0180,0800,0000,1219 :3313      ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 115F, 0000,003C,0180,0800,0000,13B1 :3314      NOP
                                     : NOW GO BACK TO SEE IF GROUP 1 IS INTACT.
U 13B1, 0010,0038,0180,0908,0200,13B2 :3315      VA_RC[1]          ; RC[1]=4CCCC000
U 13B2, 0010,0038,0180,09D0,0000,13B3 :3316      RC[0A]_LC
U 13B3, 0000,003C,0180,0910,0000,1160 :3317      LC RC[2]          ; RC[2]=0AAAAA80, EXPECTED RELOCATED ADDRESS
U 1160, 0010,0039,0180,0AB8,0000,1258 :3318      R[7]_LC,CALL J/HIT1 ; CHECK FOR HIT IN GROUP 1
U 1161, 0000,003D,0180,0800,0000,1219 :3319      ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1162, 0000,003D,0180,0800,0000,1219 :3320      ERROR1          ; A TB MISS TRAP OCCURRED.
U 1163, 0000,003D,0180,0800,0000,1219 :3321      ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1164, 0000,003D,0180,0800,0000,1232 :3322      CALL J/RELCHK      ; CHECK THE RELOCATED ADDRESS
U 1165, 0000,003D,0180,0800,0000,1219 :3323      ERROR1          ; A UTRAP OCCURRED.
U 1166, 0000,003D,0180,0800,0000,1219 :3324      ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1167, 0000,003C,0180,0800,0000,11F6 :3325      NOP
                                     : NOW TEST GROUP 1
U 11F6, 0000,003D,0180,0800,0000,1218 :3326      ERLOOP
U 11F7, 0000,003C,8580,0800,0084,73B4 :3327      TBFLT1: SC K[C]
U 13B4, 0803,001C,0180,0800,0000,13B5 :3328      ALU_NOT.MASK,D_ALU ; D=1000
U 13B5, 0000,003C,6580,3C00,0000,13B6 :3329      ID[5B].ERR,_D      ; UNLOCK THE TIME OUT ADDRESS REGISTER
U 13B6, 0010,0038,0180,0920,0200,13B7 :3330      VA_RC[4]          ; VA=RC[4]=55554000
U 13B7, 0000,003C,0180,0918,0000,11F8 :3331      LC RC[3]          ; RC[3]=PTE=A4199999
U 11F8, 0010,0039,0180,0AC0,0000,1044 :3332      R[8]_LC,CALL J/TBWRB ; WRITE THE VA AND PTE INTO BOTH GROUPS
U 11F9, 0000,003C,0180,0A20,0082,13B8 :3333      SC R[4]           ; GENERATE THE TEST PATTERN
U 13B8, 0000,003C,01C0,0A60,0000,13B9 :3334      Q R[0C]
U 13B9, 0001,201C,01C0,0800,0000,13BA :3335      ALU_Q.ORNOT.MASK,Q_ALU
U 13BA, 0000,003C,0180,0A08,0200,13BB :3336      VA RC[1]          ; RC[1]=VA=2AAA8000
U 13BB, 0000,003C,0180,09D0,0000,13BC :3337      RC[0A]_LA
    
```



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U 13BC, 0000,003C,0180,0AAB,0000,11FA :3342 R[5]_LA
U 11FA, 0001,203D,0180,0AB0,0000,1048 :3343 R[6]_Q,CALL,J/RELSUB ; GENERATE THE EXPECTED RELOCATED ADDRESS
U 11FB, 0000,003C,01C0,0A30,0000,13BD :3344 Q R[6]
U 13BD, 0001,203C,0180,0AC0,0000,1200 :3345 R[8]_Q
U 1200, 0000,003D,0180,0800,0000,1024 :3346 =0 CALL,J/TBWR1 ; WRITE THIS TEST PATTERN INTO GROUP 1
U 1201, 0000,003C,0180,0800,0000,1168 :3347 NOP
U 1168, 0000,003D,0180,0800,0000,1258 :3348 =000 CALL,J/HIT1 ; READ VA=2AAA8000, SHOULD HIT IN GROUP 1
U 1169, 0000,003D,0180,0800,0000,1219 :3349 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 116A, 0000,003D,0180,0800,0000,1219 :3350 ERROR1 ; A TB MISS TRAP OCCURRED.
U 116B, 0000,003D,0180,0800,0000,1219 :3351 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 116C, 0000,003D,0180,0800,0000,1232 :3352 =0 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 116D, 0000,003D,0180,0800,0000,1219 :3353 ERROR1 ; A UTRAP OCCURRED.
U 116E, 0000,003D,0180,0800,0000,1219 :3354 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 116F, 0000,003C,0180,0800,0000,13BE :3355 NOP
U 13BE, 0000,003C,0180,0A20,0082,13BF :3356 SC R[4] ; GENERATE THE COMPLIMENT TEST PATTERN
U 13BF, 0000,003C,01C0,0A68,0000,13C0 :3357 Q R[0D]
U 13C0, 0001,2034,01C0,0A60,0000,1202 :3358 ALU_Q.AND.MASK,Q,ALU,LAB R[0C]
U 1202, 001C,0031,01C0,0AB0,0000,1048 :3359 =0 ALU_LA[OR]Q,Q,ALD,R[6]_ALU,CALL,J/RELSUB
U 1203, 0000,003C,01C0,0A30,0000,13C1 :3360 Q R[6]
U 13C1, 0001,203C,0180,0AC0,0000,1204 :3361 R[8]_Q
U 1204, 0000,003D,0180,0800,0000,1024 :3362 =0 CALL,J/TBWR1 ; VA=2AAA80000
:3363 ; WRITE COMPLIMENT PATTERN INTO GROUP 1
U 1205, 0000,003C,0180,0800,0000,1170 :3364 NOP
U 1170, 0000,003D,0180,0800,0000,1258 :3365 =000 CALL,J/HIT1 ; READ HIT IN GROUP 1
U 1171, 0000,003D,0180,0800,0000,1219 :3366 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1172, 0000,003D,0180,0800,0000,1219 :3367 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1173, 0000,003D,0180,0800,0000,1219 :3368 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1174, 0000,003D,0180,0800,0000,1232 :3369 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1175, 0000,003D,0180,0800,0000,1219 :3370 ERROR1 ; A UTRAP OCCURRED.
U 1176, 0000,003D,0180,0800,0000,1219 :3371 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1177, 0000,003C,0180,0800,0000,13C2 :3372 NOP
:3373 ; NOW GO BACK TO SEE IF GROUP 0 IS INTACT.
U 13C2, 0010,0038,0180,0920,0200,13C3 :3374 VA RC[4] ; VA=RC[4]=55554000
U 13C3, 0010,0038,0180,09D0,0000,13C4 :3375 RC[0A] LC
U 13C4, 0000,003C,0180,0928,0000,1180 :3376 LC RC[5] ; RC[5]=0CCCCC80
U 1180, 0010,0039,0180,0AB8,0000,124C :3377 =000 R[7]_LC,CALL,J/HITO ; VA=55554000 SHOULD HIT IN GROUP 0
U 1181, 0000,003D,0180,0800,0000,1219 :3378 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1182, 0000,003D,0180,0800,0000,1219 :3379 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1183, 0000,003D,0180,0800,0000,1219 :3380 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1184, 0000,003D,0180,0800,0000,1232 :3381 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1185, 0000,003D,0180,0800,0000,1219 :3382 ERROR1 ; A UTRAP OCCURRED.
U 1186, 0000,003D,0180,0800,0000,1219 :3383 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1187, 0000,003C,0180,0800,0000,13C5 :3384 NOP
U 13C5, 0000,003C,0180,0A20,0010,13C6 :3385 ALU_RC[4],CLK.UBCC ; SEE IF ALL TEST PATTERNS HAVE BEEN TRIED.
U 13C6, 0000,013C,0180,0800,0000,1206 :3386 Z?
U 1206, 0018,0000,0580,0AA0,0000,11EA :3387 =0 R[4]_LA-K[.1],J/TBFLTO ; IF NOT CONTINUE
U 1207, 0000,003C,0180,0800,0000,1208 :3388 NOP
:3389 =0
U 1208, 0000,003D,0180,0800,0000,1076 :3390 DUMMY1: NEWTST

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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1871=	1838	1845=	1861=	1862=	1863=	1839	2292=
U 1008	2717=	2718=	2719=	2720=	1951=	1952=	1840	2293=
U 1010	2783=	2784=	2785=	2786=	1970=	1971=	1841	2294=
U 1018	2844=	2845=	2846=	2847=	1972=	1973=	1842	2295=
U 1020	2854=	2855=	2856=	2857=	1982=	1983=	1843	2327=
U 1028	2954=	2955=	2956=	2957=	1984=	1985=	1844	2328=
U 1030	2962=	2963=	2964=	2965=	1986=	1987=	1864	2329=
U 1038	3168=	3169=	3170=	3171=	1992=	1993=	1865	2330=
U 1040	3207=	3208=	3209=	3210=	1996=	1997=	1866	2400=
U 1048	2006=	2007=	2008=	2009=	2019=	2020=	1902:	2401=
U 1050	2026=	2027=	2028=	2029=	2038=	2039=	1867	2402=
U 1058	2047=	2048=	1905:	1868	2055=	2056=	1908:	2403=
U 1060	2060=	2061=	2070=	2071=	2079=	2080=	1869	2439=
U 1068	2082=	2083=	2087=	2088=	2115=	2116=	1870	2440=
U 1070	2118=	2119=	2121=	2122=	2125=	2126=	1880	2441=
U 1078	2128=	2129=	2131=	2132=	2135=	2136=	1881	2442=
U 1080	2659=	2660=	2661=	2662=	2663=	2664=	2665=	2666=
U 1088	2684=	2685=	2686=	2687=	2688=	2689=	2690=	2691=
U 1090	2737=	2738=	2739=	2740=	2741=	2742=	2743=	2744=
U 1098	2139=	2140=	2179=	2180=	2668=	2669=	2670=	2671=
U 10A0	2755=	2756=	2757=	2758=	2759=	2760=	2761=	2762=
U 10A8	2802=	2803=	2804=	2805=	2806=	2807=	2808=	2809=
U 10B0	2820=	2821=	2822=	2823=	2824=	2825=	2826=	2827=
U 10B8	2184=	2185=	2187=	2188=	2693=	2694=	2695=	2696=
U 10C0	2868=	2869=	2870=	2871=	2872=	2873=	2874=	2875=
U 10C8	2900=	2901=	2902=	2903=	2904=	2905=	2906=	2907=
U 10D0	2918=	2919=	2920=	2921=	2922=	2923=	2924=	2925=
U 10D8	2189=	2190=	2194=	2195=	2722=	2723=	2724=	2725=
U 10E0	2990=	2991=	2992=	2993=	2994=	2995=	2996=	2997=
U 10E8	3005=	3006=	3007=	3008=	3009=	3010=	3011=	3012=
U 10F0	3024=	3025=	3026=	3027=	3028=	3029=	3030=	3031=
U 10F8	2197=	2198=	2199=	2200=	2788=	2789=	2790=	2791=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1882	2204=	2205=	1834:	1835:	1836:	1837:
U 1110	3040=	3041=	3042=	3043=	3044=	3045=	3046=	3047=
U 1118	3085=	3086=	3087=	3088=	3089=	3090=	3091=	3092=
U 1120	3103=	3104=	3105=	3106=	3107=	3108=	3109=	3110=
U 1128	3131=	3132=	3133=	3134=	3135=	3136=	3137=	3138=
U 1130	3148=	3149=	3150=	3151=	3152=	3153=	3154=	3155=
U 1138	3186=	3187=	3188=	3189=	3190=	3191=	3192=	3193=
U 1140	3224=	3225=	3226=	3227=	3228=	3229=	3230=	3231=
U 1148	3292=	3293=	3294=	3295=	3296=	3297=	3298=	3299=
U 1150	2207=	2208=	2209=	2210=	1883	1928:	2214=	2215=
U 1158	3309=	3310=	3311=	3312=	3313=	3314=	3315=	3316=
U 1160	3321=	3322=	3323=	3324=	3325=	3326=	3327=	3328=
U 1168	3348=	3349=	3350=	3351=	3352=	3353=	3354=	3355=
U 1170	3365=	3366=	3367=	3368=	3369=	3370=	3371=	3372=
U 1178	2217=	2218=	2255=	2256=	2223:	2224:	2225:	2226:
U 1180	3377=	3378=	3379=	3380=	3381=	3382=	3383=	3384=
U 1188	2261=	2262=	2263=	2264=	2284=	2286=	2297=	2299=
U 1190	2319=	2321=	2332=	2334=	2336=	2337=	2355=	2356=
U 1198	2362=	2363=	2364=	2365=	2390=	2392=	2429=	2431=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2446=	2447=	2464=	2465=	2473=	2474=	2489=	2490=
U 11A8	2595=	2596=	2597=	2598=	2599=	2600=	2601=	2602=
U 11B0	2603=	2604=	2608=	2614=	2616=	2623=	2626=	2627=
U 11B8	2631=	2638=	2641=	2642=	2646=	2647=	2648=	2656=
U 11C0	2706=	2707=	2711=	2712=	2772=	2773=	2777=	2778=
U 11C8	2836=	2837=	2884=	2885=	2889=	2897=	2934=	2942=
U 11D0	2944=	2945=	2977=	2978=	3053=	3054=	3056=	3062=
U 11D8	3064=	3072=	3074=	3082=	3120=	3121=	3159=	3160=
U 11E0	3197=	3198=	3264=	3265=	3266=	3267=	3268=	3269=
U 11E8	3270=	3271=	3273=	3274=	3279=	3280=	3286=	3287=
U 11F0	3289=	3291=	3303=	3304=	3306=	3308=	3330=	3331=
U 11F8	3336=	3337=	3343=	3344=	2227:	2228:	2229:	2230:
U 1200	3346=	3347=	3359=	3360=	3362=	3364=	3387=	3388=
U 1208	3390=	1884	1885	1886	1887	1888	1889	1890
U 1210	1891	1892	1893	1894	1895	1896	1897	1898
U 1218	1899	1900	1901	1903	1904	1936	1937	1943
U 1220	1944	1945	1950	1953	1954	1957	1958	1959
U 1228	1960	1963	1964	1965	1988	1989	1999	2010
U 1230	2011	2012	2018	2021	2022	2023	2024	2025
U 1238	2030	2031	2032	2033	2034	2035	2036	2037
U 1240	2040	2041	2046	2049	2050	2051	2052	2053
U 1248	2054	2057	2058	2059	2068	2072	2073	2074
U 1250	2075	2076	2077	2078	2081	2084	2085	2086
U 1258	2090	2092	2093	2094	2095	2096	2097	2098
U 1260	2099	2100	2101	2102	2103	2104	2105	2106
U 1268	2107	2108	2109	2110	2111	2112	2113	2117
U 1270	2123	2127	2133	2137	2141	2167	2168	2169
U 1278	2170	2171	2172	2173	2174	2175	2176	2177
U 1280	2178	2181	2182	2183	2186	2191	2192	2193
U 1288	2196	2201	2202	2203	2206	2211	2212	2213
U 1290	2216	2222	2257	2258	2259	2260	2265	2266
U 1298	2267	2268	2269	2270	2271	2272	2273	2274
U 12A0	2275	2276	2277	2278	2279	2280	2281	2282
U 12A8	2283	2287	1929:	2288	2289	2290	2291	2296
U 12B0	2301	2302	2303	2304	2305	2306	2307	2308
U 12B8	2309	2310	2311	2312	2313	2314	2315	2316
U 12C0	2317	2318	2322	2323	2324	2325	2326	2331
U 12C8	2335	2357	2358	2359	2360	2361	2366	2367
U 12D0	2368	2369	2370	2371	2372	2373	2374	2375
U 12D8	2376	2377	2378	2379	2380	2381	2382	2383
U 12E0	2384	2385	2386	2387	2388	2389	2393	2394
U 12E8	2395	2396	2397	2398	2399	2404	2406	2407
U 12F0	2408	2409	2410	2411	2412	2413	2414	2415
U 12F8	2416	2417	2418	2419	2420	2421	2422	2423
U 1300	2424	2425	2426	2427	2428	2432	2433	2434
U 1308	2435	2436	2437	2438	2443	2444	2445	2466
U 1310	2467	2468	2469	2470	2471	2472	2475	2476
U 1318	2477	2478	2479	2480	2481	2482	2483	2484
U 1320	2485	2486	2487	2488	2605	2606	2607	2615
U 1328	2624	2625	2628	2629	2630	2639	2640	2643
U 1330	2644	2645	2657	2658	2667	2672	2681	2682
U 1338	2683	2692	2697	2703	2704	2705	2708	2709
U 1340	2710	2716	2721	2734	2735	2736	2752	2753

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ESKAH27.MCR

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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2754	2769	2770	2771	2774	2775	2776	2782
U 1350	2787	2799	2800	2801	2817	2818	2819	2833
U 1358	2834	2835	2843	2853	2865	2866	2867	2881
U 1360	2882	2883	2886	2887	2888	2898	2899	2915
U 1368	2916	2917	2931	2932	2933	2943	2953	2961
U 1370	2973	2974	2975	2976	2987	2988	2989	3002
U 1378	3003	3004	3021	3022	3023	3037	3038	3039
U 1380	3055	3063	3073	3083	3084	3100	3101	3102
U 1388	3118	3119	3128	3129	3130	3145	3146	3147
U 1390	3161	3162	3163	3167	3175	3176	3183	3184
U 1398	3185	3199	3200	3201	3202	3206	3214	3215
U 13A0	3221	3222	3223	3275	3276	3277	3278	3281
U 13A8	3282	3283	3284	3285	3288	3300	3301	3302
U 13B0	3305	3318	3319	3320	3332	3333	3334	3335
U 13B8	3338	3339	3340	3341	3342	3345	3356	3357
U 13C0	3358	3361	3374	3375	3376	3385	3386	
U 13C8 - 13EF Unused								
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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Words not
in bounds

ESKODEF	0
ESKOOAC	0
ESKAHMAC	0
ESKAH27	983

Used	983
Remaining	

Total microwords used in memory U: 983

Total microwords remaining in memory U: 0

Highest address used in memory U: 13FF (hex)

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; The files used in this assembly are:

ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH27.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2227	TEST A6 ADDRESS PATH TO AND FROM TAG MEMORY TEST
: 2378	TEST A7 GROUP 0 COMPARATORS TEST
: 2560	TEST A8 GROUP 1 COMPARATORS TEST
: 2735	TEST A9 TB PARITY LOGIC TEST
: 2979	TEST AA MODIFY BIT UTRAP TEST
: 3127	TEST AB TB VALID BIT UTRAP TEST

ZZ-ESKAH-V132 Subroutines
ESKAH28.MCR

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Page

:1
:1804 .NOLIST
:1805 .LIST


```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      :+
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN0.
:1819
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823
:1824      :-
:1825      1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
:1826      1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
:1827      1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
:1828      1103: SC_K[.3],J/TRPH0      : TB MODIFY
:1829      1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
:1830      1105: SC_K[.6],J/TRPH0      : TB MISS
:1831      1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
:1832      1107: SC_K[.7],J/TRPH0      : TB PARITY
:1833      1108: SC_K[.8],J/TRPH0      : CACHE PARITY
:1834      110C: SC_K[.C],J/TRPH1      : RDS
:1835      110D: SC_K[.D],J/TRPH1      : TIME OUT
:1836      110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
:1837      110F: SC_K[.F],J/TRPH1     : CS PARITY
:1838      TRPH0: Q_ID[USTACK]
:1839      : Q_D,D Q
:1840      : ID[USTACK]_D
:1841      : Q_D,D Q
:1842      : Q-R[OF]
:1843      : ALU_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
:1844      : Z?                                : BRANCH IF NO
:1845      : =0 ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 : CLEAR THE BIT AND RETURN
:1846      :+
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      :-

```

```

U 1100. 0000.003C.1980.0800.0084.7003
U 1101. 0000.003C.0580.0800.0084.7001
U 1102. 0000.003C.0980.0800.0084.7001
U 1103. 0000.003C.0D80.0800.0084.7001
U 1104. 0000.003C.1180.0800.0084.7001
U 1105. 0000.003C.D580.0800.0084.7001
U 1106. 0000.003C.D980.0800.0084.7001
U 1107. 0000.003C.5D80.0800.0084.7001
U 1108. 0000.003C.0180.0800.0084.7001
U 110C. 0000.003C.8580.0800.0084.7003
U 110D. 0000.003C.8980.0800.0084.7003
U 110E. 0000.003C.6580.0800.0084.7001
U 110F. 0000.003C.6180.0800.0084.7003
U 1001. 0000.003C.81F0.2C00.0000.104F
U 104F. 0C00.003C.01E0.0800.0000.105B
U 105B. 0000.003C.8180.3C00.0000.105F
U 105F. 0C00.003C.01E0.0800.0000.10C5
U 10C5. 0000.003C.01C0.0A78.0000.1109
U 1109. 0001.2024.0180.0800.0010.1154
U 1154. 0000.013C.0180.0800.0000.1002
U 1002. 0001.2036.0180.0AF8.0000.0000

```

U 1003, 0018,0038,1D80,09E8,0000,104C :1861
U 104C, 0000,003D,D980,0800,0084,7210 :1862
U 104D, 0000,003C,49F0,2C00,0000,11EB :1863
U 11EB, 0001,203C,4DF0,2DB0,0000,11EC :1864
U 11EC, 0001,203C,65F0,2DB8,0000,11ED :1865
U 11ED, 0001,203C,6DF0,2DD8,0000,11EE :1866
U 11EE, 0001,203C,75F0,2DE0,0000,11EF :1867
U 11EF, 0001,203C,79F0,2DC8,0000,11F0 :1868
U 11F0, 0001,203C,69F0,2DC0,0000,11F1 :1869
U 11F1, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,120A :1871

U 11F2, 0000,003C,65F8,0800,0084,71F3 :1880
U 11F3, 0818,0038,8D80,0800,0000,11F4 :1881
U 11F4, 0D00,003C,0180,0800,0000,11F5 :1882
U 11F5, 0000,003C,3D80,3C00,0000,11F6 :1883
U 11F6, 0818,0038,0580,0800,0000,11F7 :1884
U 11F7, 0D00,003C,0180,0800,0000,11F8 :1885
U 11F8, 0F00,003C,3180,3C00,0000,11F9 :1886
U 11F9, 0000,003C,5D80,3C00,0000,11FA :1887
U 11FA, 0000,003C,3980,3C00,0000,11FB :1888
U 11FB, 0000,003C,2980,3C00,0000,1200 :1889
U 1200, 0000,003C,4980,3C00,0000,1201 :1890
U 1201, 0818,0038,C180,0800,0000,1202 :1891
U 1202, 0000,003C,6580,3C00,0000,1203 :1892
U 1203, 0F00,003C,6D80,3C00,0000,1204 :1893
U 1204, 0000,003C,6D80,3C00,0000,1205 :1894
U 1205, 0000,003C,6580,3C00,0000,1206 :1895
U 1206, 0003,003C,0180,09F0,0000,1207 :1896
U 1207, 0003,003C,0180,0AF8,0000,1208 :1897
U 1208, 0003,003C,0180,09E8,0000,105E :1898
U 1209, 0818,0038,0980,0800,0000,105E :1899
U 120A, 0810,0038,0180,0978,0000,120B :1900
U 120B, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 120C, 0810,0038,0180,0978,0000,120D :1903
U 120D, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905

U 105E, 0000,003C,1D80,3C00,0000,105E :1906

U 13F0, 0000,003C,0180,0800,0000,13F1 :1907
U 13F1, 0000,003C,0180,0800,0000,13F2 :1908
U 13F2, 0000,003C,0180,0800,0000,13F3 :1909
U 13F3, 0000,003C,0180,0800,0000,13F4 :1910

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWTST
ERLOOP
ERROR1
ERROR2

SCOPE: SC K[.10],Q_0

D_R[.1F]
D_DAL.SC
ID[PSL]_D
D_K[.1]
D_DAL.SC
ID[CES]_D,D_0
ID[ACC.[CS]]_D
ID[SIR]_D
ID[CLK.[CS]]_D
ID[TBER0]_D
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0E]_0
RC[0F]_0

RC[0D]_0,J/CALLCON
ERLOOP: D_K[.2],J/CALLCON
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:

CALLCON: ID[TXDB]_D,J/CALLCON

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

: SETUP TO WRITE IPL OF 1F
: ...

: WRITE THE PSL
: SETUP TO CLEAR THE CES REGISTER

: CLEAR THE CES REGISTER
: SHUT OFF THE FLOATING POINT
: CLEAR THE SIR REGISTER
: STOP INTERVAL TIMER
: SHUT OFF THE TB

: CALL THE CONSOLE
: ERRLOOP CALL

: CALL THE CONSOLE

ZZ-ESKAH-V132 Subroutines
ESKAH2B.MCR

MICRO2 1M(01)

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SEQ 0402
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```

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,120E :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 120E, 0810,0038,4D80,0978,0000,120F :1936
U 120F, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 1210, 0010,0038,01C0,0978,0000,1211 :1943
U 1211, 0019,2034,4DC0,0800,0000,1212 :1944
U 1212, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
:1948
:1949
U 1213, 0F18,0038,C1F8,0800,0000,1058 :1950
U 1058, 0500,003D,0380,0800,0000,125A :1951
U 1059, 0000,003C,8580,0800,0084,7214 :1952
U 1214, 0D00,003C,0180,0800,0000,1215 :1953
U 1215, 0000,003E,7580,3C00,0000,0001 :1954
:1955
:1956
U 1216, 0818,0038,0DF8,0800,0000,1217 :1957
U 1217, 0000,003C,6180,0800,0084,7218 :1958
U 1218, 0D00,003C,0180,0800,0000,1219 :1959
U 1219, 0000,003E,7580,3C00,0000,0001 :1960
:1961
:1962
U 121A, 0000,003C,8580,0800,0084,721B :1963
U 121B, 0803,001C,0180,0800,0000,121C :1964
U 121C, 0000,003E,7580,3C00,0000,0001 :1965
:1966
:1967
:1968
:1969
U 105C, 0000,003D,0180,0800,0000,125E :1970

```

```

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

```

```

: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.

```

```

SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

```

```

: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

```

```

SETRCF: Q RC[0F]
Q-Q,AND,K[.FF00]
RC[0F],Q,OR,SC,RETURN1

```

```

: THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
: AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
: UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
: ARE LOST.

```

```

CSOFF: D 0,Q 0,ALU,K[.FFFF]
=0 D-D,LEFT,S177,CALL,J/DC9
SC K[C]
D BAL,SC
ID[MAINT],D,RETURN1

```

```

: THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
: BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.

```

```

COFF: D K[3],Q 0
SC K[F]
D BAL,SC
ID[MAINT],D,RETURN1

```

```

: THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
: APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.

```

```

SOFF: SC K[C]
ALD NOT,MASK,D,ALU
ID[MAINT],D,RETURN1

```

```

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.

```

```

=0
DC.DE: CALL,J/DCD

```



```

U 105D, 0000,003C,0180,0800,0000,10C6 :1971
U 10C6, 0000,003D,0180,0800,0000,125F :1972
U 10C7, 0000,003E,0180,0800,0000,0001 :1973
:1974
:1975
:1976
:1977
:1978
:1979
:1980
:1981
U 10E8, 0F00,003D,0180,0800,0000,1259 :1982
U 10E9, 0100,003C,0180,0800,0000,10EA :1983
U 10EA, 0100,003D,0180,0800,0000,1251 :1984
U 10EB, 0100,003C,0180,0800,0000,10EC :1985
U 10EC, 0100,003D,0180,0800,0000,1252 :1986
U 10ED, 0800,003C,4980,3E40,0000,121D :1987
U 121D, 0000,003C,4180,3C00,0000,121E :1988
U 121E, 0000,003E,4DF0,2C00,0000,0001 :1989
:1990
:1991
U 10EE, 0F00,003D,0180,0800,0000,1255 :1992
U 10EF, 0000,003C,0180,0800,0000,10E9 :1993
:1994
:1995
U 10F0, 0F00,003D,0180,0800,0000,1259 :1996
U 10F1, 0500,003C,0180,0800,0000,10E9 :1997
:1998
U 121F, 0818,003B,0580,0800,0000,10ED :1999
:2000
:2001
:2002
:2003
:2004
:2005
U 10F2, 0800,003D,0180,0A30,0000,1251 :2006
U 10F3, 0500,003C,D980,0A28,0084,70F4 :2007
U 10F4, 0003,0011,01C0,0800,0000,1251 :2008
U 10F5, 001C,0024,01C0,0800,0000,1220 :2009
U 1220, 081D,0030,0180,0800,0000,1221 :2010
U 1221, 0200,003C,0180,0800,0000,1222 :2011
U 1222, 0001,003E,0180,0A88,0000,0001 :2012
:2013
:2014
:2015
:2016
:2017
U 1223, 0000,003C,0180,0A70,0000,1224 :2018
U 1224, 0000,003C,0180,52F8,0000,1225 :2019
U 1225, 0800,003C,69F0,2E78,0000,1226 :2020
U 1226, 0018,0038,1980,0AF8,0000,1227 :2021
U 1227, 0000,003C,0180,0A70,0000,1228 :2022
U 1228, 001C,2000,0180,0800,0010,1229 :2023
U 1229, 0000,013C,0180,0800,0000,10F6 :2024
U 10F6, 0001,003C,0180,09C8,0000,1232 :2025

```

```

NOP
=0 CALL,J/DCE
RETURN1
: THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
: IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
: VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
: MME WILL BE SET HERE. UPON RETURN THE CONTENTS
: OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
: D AND Q ARE LOST.
: THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DC8
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWRA: ID[TBER0] D,D_R[8]
ID[TBUF] B
Q_ID[TBER1],RETURN1
: ROUTINE TO WRITE GROUP 0
=0
TBWR0: D_0,CALL,J/DC4
J7TBWR
: ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DC8
D_D.LEFT,SI/ZERO,J/TBWR
: THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D_K[1],J/TBWRA
: THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
: THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
: R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
: TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
: R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC_K[9],LAB_R[5]
=0 A[U_MASK+1,Q_ALU,CALL,J/DC0
ALU_LA[ANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
: THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
: TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
: RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
: AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
: INDICATED IN R[E].
RELCHK: LAB_R[0E]
R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERENCE
Q_ID[TIME.ADDR],D_R[0F]
A[U_0(K),R[0F],ALU
LAB_R[0E]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
??
=0 RC[9]_D,J/TBTRUE ; TRAPPED SO RETURN1.

```



```

U 10F7, 0000,003C,0180,0800,0000,10F8 :2026
U 10F8, 0F00,003D,0180,0800,0000,125F :2027
U 10F9, 0500,003C,0180,0800,0000,122A :2028
U 122A, 0001,003C,0180,0800,0082,122B :2029
U 122B, 0803,0010,0180,0800,0000,122C :2030
U 122C, 001D,2024,01C0,0800,0000,122D :2031
U 122D, 0800,003C,0180,0A38,0000,122E :2032
U 122E, 0001,003C,0180,09E0,0000,122F :2033
U 122F, 0001,203C,0180,09D8,0000,1230 :2034
U 1230, 001D,2000,0180,0800,0010,1231 :2035
U 1231, 0000,013C,0180,0800,0000,10FA :2036
U 10FA, 0000,003E,0180,0800,0000,0002 :2037
U 10FB, 0000,003E,0180,0800,0000,0003 :2038
U 1232, 0000,003C,4DF0,2C00,0000,1233 :2039
U 1233, 0001,203E,0180,09F0,0000,0001 :2040

U 1234, 0000,003C,0180,0A70,0000,1235 :2045
U 1235, 0000,003C,0180,52F8,0000,1236 :2046
U 1236, 0800,003C,0180,0A78,0000,1237 :2047
U 1237, 0018,0038,1980,0AF8,0000,1238 :2048
U 1238, 0000,003C,0180,0A70,0000,1239 :2049
U 1239, 0001,003C,0180,09C8,0000,123A :2050
U 123A, 001C,2000,0180,0800,0010,123B :2051
U 123B, 0000,013C,0180,0800,0000,10FC :2052
U 10FC, 0000,003C,0180,0800,0000,123C :2053
U 10FD, 0000,003E,0180,0800,0000,0001 :2054
U 123C, 0000,003C,D580,0800,0084,723D :2055
U 123D, 0001,0024,0180,0800,0010,123E :2056
U 123E, 0000,013C,4DF0,2C00,0000,10FE :2057
U 10FE, 0001,203E,0180,09F0,0000,0002 :2058
U 10FF, 0000,003E,0180,0800,0000,0003 :2059

U 123F, 0000,003C,D580,0A70,0084,7240 :2066
U 1240, 0000,003C,0180,52F8,0000,1241 :2067
U 1241, 0800,003C,49F0,2E78,0000,1242 :2068
U 1242, 0018,0038,1980,0AF8,0000,1243 :2069
U 1243, 0001,203C,0180,09E8,0000,1244 :2070
U 1244, 0003,001C,0180,09F0,0000,1245 :2071
U 1245, 0000,003C,0180,0A70,0000,1246 :2072
U 1246, 001C,2000,0180,0800,0010,1247 :2073
U 1247, 0001,013C,0180,09C8,0000,110A :2074
U 110A, 0000,003C,0180,0800,0000,1249 :2075
U 110B, 0001,2024,0180,0800,0010,1248 :2076
U 1248, 0000,013C,0180,0800,0000,1110 :2077
U 1110, 0000,003E,0180,0800,0000,0004 :2078
U 1111, 0000,003E,0180,0800,0000,0003 :2079
U 1249, 0000,003C,D580,0800,0084,724A :2080

```

```

NOP
=0 D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
D_D.LEFT,S1/ZERO
SC D
ALD_MASK+1,D_ALU
ALU_Q[ANDNOT]D,Q_ALU
D R[7] ; SEE IF ADDRESS RELOCATED
RC[0C]-D
RC[0B]-Q
ALU_Q-D,CLK_UBCC ; PROPERLY.
Z?
=0 RETURN2 ; INCORRECT.
RETURN3 ; OK
TBTRUE: Q_ID[TBER1]
RC[0E] Q_RETURN1
; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
; IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
MISS: LAB R[0E]
RC[0F] LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
D R[0F]
A[U_0(K),R[0F],ALU
LAB R[0E]
RC[9]-D
ALU_LA[A-B]D,CLK_UBCC ; SEE IF A TRAP OCCURRED.
Z?
=0 J/MISSA
RETURN1 ; NO TRAP SO RETURN1.
MISSA: SC K[.6] ; IF A TRAP OCCURRED SEE
ALD D,ANDNOT.MASK,CLK_UBCC ; IF IT WAS A TB MISS TRAP.
Z? Q_ID[TBER1]
=0 RETURN2,RC[0E]-Q ; NOT TB MISS.
RETURN3 ; TB MISS.
; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
; HIT/MISS BIT IN TBER0 IS INCORRECT.
; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
; CHECK HIT IN GROUP 0.
HITO: LAB R[0E],SC K[.6]
HIT: RC[0F] LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
Q_ID[TBER0],D R[0F]
A[U_0(K),R[0F],ALU
RC[0D]-Q
RC[0E]-ALU,ALU_NOT.MASK
LAB R[0E]
ALU_LA[A-B]D,CLK_UBCC ; SEE IF TRAP OCCURRED.
Z?,RC[9]-D
=0 J/HITA ; TRAP OCCURRED.
ALU_Q,ANDNOT.MASK,CLK_UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?
Z?
=0 RETURN4 ; SET SO IT WAS A HIT.
RETURN3 ; CLEAR SO REFERENCE WAS A MISS.
HITA: SC_K[.6] ; TRAPPED, SO SEE IF TB MISS TRAP.

```

```
U 124A, 0001,0024,0180,0800,0010,124B :2081      ALU_D.ANDNOT.MASK,CLK.UBCC
U 124B, 0000,013C,0180,0800,0000,1112 :2082      Z?
U 1112, 0000,003C,0180,0800,0000,1232 :2083      =0      J/TBTRUE      : NOT TB MISS TRAP.
U 1113, 0000,003E,0180,0800,0000,0002 :2084      RETURN2      : TB MISS TRAP OCCURRED.
:2085      ; CHECK HIT IN GROUP 1.
U 124C, 0000,003C,5D80,0A70,0084,7240 :2086      HIT1: LAB R[OE],SC K[.7],J/HIT
:2087      ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 124D, 0118,0038,1B80,0800,0000,1261 :2088      S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 124E, 0118,0038,0B80,0800,0000,1261 :2089      S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 124F, 0118,0038,0780,0800,0000,1261 :2090      S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1250, 0118,0038,C380,0800,0000,1261 :2091      S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 1251, 0018,0038,1980,0800,0000,124D :2092      DC0: ALU_0(K),J/S00
U 1252, 0018,0038,1980,0800,0000,124E :2093      DC1: ALU_0(K),J/S01
U 1253, 0018,0038,1980,0800,0000,124F :2094      DC2: ALU_0(K),J/S10
U 1254, 0018,0038,1980,0800,0000,1250 :2095      DC3: ALU_0(K),J/S11
U 1255, 0018,0038,0980,0800,0000,124D :2096      DC4: ALU_K[.2],J/S00
U 1256, 0018,0038,0980,0800,0000,124E :2097      DC5: ALU_K[.2],J/S01
U 1257, 0018,0038,0980,0800,0000,124F :2098      DC6: ALU_K[.2],J/S10
U 1258, 0018,0038,0980,0800,0000,1250 :2099      DC7: ALU_K[.2],J/S11
U 1259, 0018,0038,0580,0800,0000,124D :2100      DC8: ALU_K[.1],J/S00
U 125A, 0018,0038,0580,0800,0000,124E :2101      DC9: ALU_K[.1],J/S01
U 125B, 0018,0038,0580,0800,0000,124F :2102      DCA: ALU_K[.1],J/S10
U 125C, 0018,0038,0580,0800,0000,1250 :2103      DCB: ALU_K[.1],J/S11
U 125D, 0018,0038,C180,0800,0000,124D :2104      DCC: ALU_K[.FFFF],J/S00
U 125E, 0018,0038,C180,0800,0000,124E :2105      DCD: ALU_K[.FFFF],J/S01
U 125F, 0018,0038,C180,0800,0000,124F :2106      DCE: ALU_K[.FFFF],J/S10
U 1260, 0018,0038,C180,0800,0000,1250 :2107      DCF: ALU_K[.FFFF],J/S11
U 1261, 0100,003E,0380,0800,0000,0001 :2108      SX: D_D.LEFT2,SI/7,RETURN1
U 1262, 0018,0038,01C0,0800,0000,1114 :2109      DC.5: Q_K[.8]
:2110      =0
U 1114, 0000,003D,0180,0800,0000,1256 :2111      DC.5A: CALL,J/DC5
U 1115, 0019,2000,05C0,0800,0010,1263 :2112      ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1263, 0000,013C,0180,0800,0000,1116 :2113      Z?
U 1116, 0000,003C,0180,0800,0000,1114 :2114      =0      J/DC.5A
U 1117, 0000,003E,0180,0800,0000,0001 :2115      RETURN1
:2116      =0
U 1118, 0000,003D,0180,0800,0000,1262 :2117      DC.A: CALL,J/DC.5
U 1119, 0500,003E,0180,0800,0000,0001 :2118      D_D.LEFT,SI/ZERO,RETURN1
U 1264, 0018,0038,01C0,0800,0000,111A :2119      DC.9: Q_K[.8]
:2120      =0
U 111A, 0000,003D,0180,0800,0000,125A :2121      DC.9A: CALL,J/DC9
U 111B, 0019,2000,05C0,0800,0010,1265 :2122      ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1265, 0000,013C,0180,0800,0000,111C :2123      Z?
U 111C, 0000,003C,0180,0800,0000,111A :2124      =0      J/DC.9A
U 111D, 0000,003E,0180,0800,0000,0001 :2125      RETURN1
:2126      =0
U 111E, 0000,003D,0180,0800,0000,1264 :2127      DC.C: CALL,J/DC.9
U 111F, 0018,0038,C180,0800,0000,1266 :2128      ALU_K[.FFFF]
U 1266, 0600,003E,0380,0800,0000,0001 :2129      D_D.RIGHT,SI/7,RETURN1
:2130      =0
U 1120, 0000,003D,0180,0800,0000,1264 :2131      DC.6: CALL,J/DC.9
U 1121, 0018,0038,0580,0800,0000,1267 :2132      ALU_K[.1]
U 1267, 0100,003E,0380,0800,0000,0001 :2133      D_D.LEFT2,SI/7,RETURN1
:2134      =0
U 1122, 0000,003D,0180,0800,0000,1264 :2135      DC.3: CALL,J/DC.9
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U 1123, 0018,0038,C180,0800,0000,1268 :2136
U 1268, 0500,003E,0380,0800,0000,0001 :2137
                                           :2138
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                                           :2160
                                           :2161
                                           :2162
U 1269, 0F18,0038,0580,0800,0000,126A :2163
U 126A, 0218,0038,0880,0800,0000,126B :2164
U 126B, 0218,0038,0880,0800,0000,126C :2165
U 126C, 0200,003C,0380,0800,0000,126D :2166
U 126D, 0001,003C,0180,0AE0,0000,126E :2167
U 126E, 0000,003C,6180,0800,0084,726F :2168
U 126F, 0043,0010,0180,0AD8,0000,1270 :2169
U 1270, 081B,0000,0580,0800,0000,1271 :2170
U 1271, 0018,0038,21C0,0800,0000,1272 :2171
U 1272, 0019,2014,0580,0800,0082,1273 :2172
U 1273, 0003,001C,01C0,0800,0000,1274 :2173
U 1274, 001D,2014,0180,0AE8,0000,1124 :2174
U 1124, 0000,003D,0180,0800,0000,1262 :2175
U 1125, 0000,003C,0180,0A68,0000,1275 :2176
U 1275, 081C,2034,0180,0800,0000,1276 :2177
U 1276, 081C,2030,0180,0A60,0000,1277 :2178
U 1277, 0001,003C,0180,0980,0000,1126 :2179
U 1126, 0001,003D,0180,0AB0,0000,111E :2180
U 1127, 0000,003C,0180,0A58,0000,1278 :2181
U 1278, 081C,2034,0180,0988,0000,1128 :2182
U 1128, 0001,003D,0180,0AA8,0000,10F2 :2183
U 1129, 0001,003C,0180,0990,0000,112A :2184
U 112A, 0000,003D,0180,0800,0000,1264 :2185
U 112B, 0000,003C,0180,0A68,0000,1279 :2186
U 1279, 081C,2034,0180,0800,0000,127A :2187
U 127A, 081C,2030,0180,0A60,0000,127B :2188
U 127B, 0001,003C,0180,0998,0000,112C :2189
U 112C, 0001,003D,0180,0AB0,0000,1262 :2190

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ALU_K[.FFFF]
D D.LEFT,S1/7,RETURN1
THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
FOLLOWING DATA PATTERNS:

R[0B] 7FFFC000
R[0C] A4000000
R[0D] 001FFFFFFF

R[0] A4155555
R[1] 4CCCC000
R[2] 0AAAAA80

R[3] A4199999
R[4] 55554000
R[5] 0CCCCC80

R[6] A40AAAAA
R[7] 33330000
R[8] 05555500

R[0] A4066666
R[1] 2AAA8000
R[2] 03333300

TBWPTP: D 0,ALU_K[.1]
D D.RIGHT2,S1/7,ALU_K[.2]
D D.RIGHT2,S1/7,ALU_K[.2]
D D.RIGHT2,S1/7
R[0C] D
SC K[.F]
ALU_MASK+1,R[0B],ALU.RIGHT,S1/ZERO
D 0=K[.1]
Q K[.14]
ALU_Q+K[.1],SC_ALU
ALU_NOT.MASK,Q_ALU
ALU_Q[A+B]D,R[0D],ALU
=0 CALL,J/DC.5
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_[A[OR]D,D_ALU
R[0] D
=0 R[6] D,CALL,J/DC.C
LAB_R[0B]
ALU_LA[AND]D,D_ALU,R[1],ALU
=0 R[5] D,CALL,J/RELSUB
R[2] D
=0 CALL,J/DC.9
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_[A[OR]D,D_ALU
R[3] D
=0 R[6] D,CALL,J/DC.5

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U 112D, 0000,003C,0180,0A58,0000,127C	:2191	LAB_R[0B]
U 127C, 081C,2034,0180,09A0,0000,112E	:2192	ALU_LA[AND]D,D,ALU,RC[4]_ALU
U 112E, 0001,003D,0180,0AA8,0000,10F2	:2193	R[5] D,CALL,J/RELSUB
U 112F, 0001,003C,0180,09A8,0000,1130	:2194	RC[5] D
U 1130, 0000,003D,0180,0800,0000,1118	:2195	CALL,J/DC.A
U 1131, 0000,003C,0180,0A68,0000,127D	:2196	LAB_R[0D]
U 127D, 081C,2034,0180,0800,0000,127E	:2197	ALU_LA[AND]D,D,ALU
U 127E, 081C,2030,0180,0A60,0000,127F	:2198	LAB_R[0C],ALU_[A[OR]D,D,ALU
U 127F, 0001,003C,0180,0980,0000,1132	:2199	RC[6] D
U 1132, 0001,003D,0180,0AB0,0000,1122	:2200	R[6] D,CALL,J/DC.3
U 1133, 0000,003C,0180,0A58,0000,1280	:2201	LAB_R[0B]
U 1280, 081C,2034,0180,0988,0000,1134	:2202	ALU_LA[AND]D,D,ALU,RC[7]_ALU
U 1134, 0001,003D,0180,0AA8,0000,10F2	:2203	R[5] D,CALL,J/RELSUB
U 1135, 0001,003C,0180,09C0,0000,1136	:2204	RC[8] D
U 1136, 0000,003D,0180,0800,0000,1120	:2205	CALL,J/DC.6
U 1137, 0000,003C,0180,0A68,0000,1281	:2206	LAB_R[0D]
U 1281, 081C,2034,0180,0800,0000,1282	:2207	ALU_LA[AND]D,D,ALU
U 1282, 081C,2030,0180,0A60,0000,1283	:2208	LAB_R[0C],ALU_[A[OR]D,D,ALU
U 1283, 0001,003C,0180,0A80,0000,1138	:2209	R[0] D
U 1138, 0001,003D,0180,0AB0,0000,1118	:2210	R[6] D,CALL,J/DC.A
U 1139, 0000,003C,0180,0A58,0000,1284	:2211	LAB_R[0B]
U 1284, 081C,2034,0180,0A88,0000,113A	:2212	ALU_LA[AND]D,D,ALU,RC[1]_ALU
U 113A, 0001,003D,0180,0AA8,0000,10F2	:2213	R[5] D,CALL,J/RELSUB
U 113B, 0001,003E,0180,0A90,0000,0001	:2214	R[2] D,RETURN1
	:2215	; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
	:2216	; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
	:2217	; WHICH COULD RESULT IN ERROR CONDITIONS.
U 1285, 0000,003F,0180,0800,0000,117C	:2218	TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001	:2219	117C: RETURN1
U 117D, 0000,003E,0180,0800,0000,0002	:2220	117D: RETURN2
U 117E, 0000,003E,0180,0800,0000,0003	:2221	117E: RETURN3
U 117F, 0000,003E,0180,0800,0000,0004	:2222	117F: RETURN4
U 11FC, 0000,003D,0180,0800,0000,120A	:2223	11FC: ERROR1
U 11FD, 0000,003D,0180,0800,0000,120A	:2224	11FD: ERROR1
U 11FE, 0000,003D,0180,0800,0000,120A	:2225	11FE: ERROR1
U 11FF, 0000,003D,0180,0800,0000,120A	:2226	11FF: ERROR1

[illegible]

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U 1148, 0010,0039,0180,0AB8,0000,10EE :2282 =0 R[7]_LC,CALL,J/TBWRO ; WRITE GROUP 0 WITH VA=TEST PATTERN
:2283 ; AND PTA=A4155555
U 1149, 0000,003C,0180,0800,0000,1008 :2284 NOP
U 1008, 0000,003D,0180,0800,0000,123F :2285 =000 CALL,J/HITO ; READ THIS TEST ADDRESS, SHOULD HIT GROUP 0
U 1009, 0000,003D,0180,0800,0000,120A :2286 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 100A, 0000,003D,0180,0800,0000,120A :2287 ERROR1 ; A TB MISS TRAP OCCURRED.
U 100B, 0000,003D,0180,0800,0000,120A :2288 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 100C, 0000,003D,0180,0800,0000,1223 :2289 CALL,J/RELCHK ; CHECK RELOCATED ADDRESS, 0AAAAA80
U 100D, 0000,003D,0180,0800,0000,120A :2290 ERROR1 ; A UTRAP OCCURRED.
U 100E, 0000,003D,0180,0800,0000,120A :2291 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 100F, 0000,003C,0180,0800,0000,128E :2292 NOP
U 128E, 0000,003C,0180,0A50,0082,128F :2293 SC R[0A] ; NOW TRY COMPLIMENT ADDRESS IN TEST
U 128F, 0800,0038,0180,0A58,0000,1290 :2294 ALU_MASK,D,ALU,LAB R[0B]
U 1290, 001C,2034,0180,09D0,0200,1291 :2295 ALU_LA[AND]D,VA_ALU,R[0A] ALU
U 1291, 0000,003C,0180,0900,0000,1292 :2296 LC R[0] ; PTE=R[0]=A4155555
U 1292, 0010,0038,0180,0AC0,0000,1293 :2297 R[8]_LC
U 1293, 0000,003C,0180,0910,0000,114A :2298 LC R[2]
U 114A, 0010,0039,0180,0AB8,0000,10EE :2299 =0 R[7]_LC,CALL,J/TBWRO ; WRITE TEST PATTERN WITH THIS PTE INTO GROUP 0
U 114B, 0000,003C,0180,0800,0000,1010 :2300 NOP
U 1010, 0000,003D,0180,0800,0000,123F :2301 =000 CALL,J/HITO ; READ SHOULD HIT GROUP 0
U 1011, 0000,003D,0180,0800,0000,120A :2302 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1012, 0000,003D,0180,0800,0000,120A :2303 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1013, 0000,003D,0180,0800,0000,120A :2304 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1014, 0000,003D,0180,0800,0000,1223 :2305 CALL,J/RELCHK ; CHECK RELOCATED ADDRESS, 0AAAAA80
U 1015, 0000,003D,0180,0800,0000,120A :2306 ERROR1 ; A UTRAP OCCURRED.
U 1016, 0000,003D,0180,0800,0000,120A :2307 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1017, 0000,003C,0180,0800,0000,1294 :2308 NOP
:2309 ; GO BACK AND MAKE SURE GROUP 1 IS INTACT.
U 1294, 0010,0038,0180,0938,0200,1295 :2310 VA R[7] ; VA=R[7]=33330000
U 1295, 0010,0038,0180,09D0,0000,1296 :2311 R[0A]_LC
U 1296, 0000,003C,0180,0940,0000,1020 :2312 LC R[8] ; RELOCATED ADDRESS=R[8]=05555500
U 1020, 0010,0039,0180,0AB8,0000,124C :2313 =000 R[7]_LC,CALL,J/HIT1 ; VA=33330000 SHOULD HIT GROUP 1
U 1021, 0000,003D,0180,0800,0000,120A :2314 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1022, 0000,003D,0180,0800,0000,120A :2315 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1023, 0000,003D,0180,0800,0000,120A :2316 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1024, 0000,003D,0180,0800,0000,1223 :2317 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1025, 0000,003D,0180,0800,0000,120A :2318 ERROR1 ; A UTRAP OCCURRED.
U 1026, 0000,003D,0180,0800,0000,120A :2319 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1027, 0000,003C,0180,0800,0000,114C :2320 NOP
:2321 ;////////////////////
:2322 ; NOW TEST GROUP 1.
:2323 =0
U 114C, 0000,003D,0180,0800,0000,1209 :2324 TBAF1: ERLOOP
U 114D, 0000,003C,0180,0A08,0200,1297 :2325 VA R[1] ; VA=R[1]=2AAA8000
U 1297, 0000,003C,0180,0A00,0000,114E :2326 LAB R[0] ; PTE=R[0]=A4066666
U 114E, 0000,003D,0180,0AC0,0000,10F0 :2327 =0 R[8]_LA,CALL,J/TBWRB ; WRITE THIS VA AND PTE INTO BOTH GROUPS
U 114F, 0800,003C,0180,0A50,0000,1298 :2328 D R[0A] ; GENERATE THE TEST ADDRESS PATTERN
U 1298, 0000,003C,0180,0A50,0082,1299 :2329 SC R[0A]
U 1299, 0003,001C,0180,09D0,0200,129A :2330 ALU_NOT_MASK,VA_ALU,R[0A] ALU
U 129A, 0000,003C,0180,0918,0000,129B :2331 LC R[3] ; PTE=R[3]=A4199999
U 129B, 0010,0038,0180,0AC0,0000,129C :2332 R[8]_LC
U 129C, 0000,003C,0180,0928,0000,1150 :2333 LC R[5]
U 1150, 0010,0039,0180,0AB8,0000,10E8 :2334 =0 R[7]_LC,CALL,J/TBWR1 ; WRITE THE TEST ADDRESS AND PTE=A4199999
:2335 ; INTO GROUP 1
U 1151, 0000,003C,0180,0800,0000,1028 :2336 NOP
    
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U 1028, 0000,003D,0180,0800,0000,124C :2337 =000 CALL,J/HIT1 ; READ BACK THE HIT IN GROUP 1
U 1029, 0000,003D,0180,0800,0000,120A :2338 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 102A, 0000,003D,0180,0800,0000,120A :2339 ERROR1 ; A TB MISS TRAP OCCURRED.
U 102B, 0000,003D,0180,0800,0000,120A :2340 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 102C, 0000,003D,0180,0800,0000,1223 :2341 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS, 0CCCC800
U 102D, 0000,003D,0180,0800,0000,120A :2342 ERROR1 ; A UTRAP OCCURRED.
U 102E, 0000,003D,0180,0800,0000,120A :2343 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 102F, 0000,003C,0180,0800,0000,129D :2344 NOP
U 129D, 0000,003C,0180,0A50,0082,129E :2345 SC R[0A] ; NOE TRY THE COMPLIMENT ADDRESS PATTERN
U 129E, 0800,0038,0180,0A58,0000,129F :2346 ALU_MASK,D,ALU,LAB R[0B]
U 129F, 001C,2034,0180,09D0,0200,12A0 :2347 ALU_LA[AND]D,VA_ALU,R[0A],ALU
U 12A0, 0000,003C,0180,0918,0000,12A1 :2348 LC R[3] ; PTE=R[3]=A4199999
U 12A1, 0010,0038,0180,0AC0,0000,12A2 :2349 R[8],LC
U 12A2, 0000,003C,0180,0928,0000,1152 :2350 LC R[5]
U 1152, 0010,0039,0180,0AB8,0000,10E8 :2351 =0 R[7],LC,CALL,J/TBWR1 ; WRITE THE TEST PATTERN=VA, AND PTE=A4199999
:2352 ; INTO GROUP 1
U 1153, 0000,003C,0180,0800,0000,1030 :2353 NOP
U 1030, 0000,003D,0180,0800,0000,124C :2354 =000 CALL,J/HIT1 ; READ THE TEST PATTERN, SHOULD HIT GROUP 1
U 1031, 0000,003D,0180,0800,0000,120A :2355 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1032, 0000,003D,0180,0800,0000,120A :2356 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1033, 0000,003D,0180,0800,0000,120A :2357 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1034, 0000,003D,0180,0800,0000,1223 :2358 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1035, 0000,003D,0180,0800,0000,120A :2359 ERROR1 ; A UTRAP OCCURRED.
U 1036, 0000,003D,0180,0800,0000,120A :2360 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1037, 0000,003C,0180,0800,0000,12A3 :2361 NOP
:2362 ; GO BACK AND MAKE SURE GROUP 0 IS INTACT.
U 12A3, 0000,003C,0180,0A08,0200,12A4 :2363 VA R[1] ; R[1]=VA=2AAA8000
U 12A4, 0000,003C,0180,09D0,0000,12A5 :2364 R[0A],LA
U 12A5, 0000,003C,0180,0A10,0000,1040 :2365 LAB R[2] ; R[2]=03333300, THE RELOCATED ADDRESS
U 1040, 0000,003D,0180,0AB8,0000,123F :2366 =000 R[7],LA,CALL,J/HITO ; VA=2AAA8000 SHOULD HIT GROUP 0
U 1041, 0000,003D,0180,0800,0000,120A :2367 ERROR1 ; A NON TB MISS TRAP OCCURRED.
U 1042, 0000,003D,0180,0800,0000,120A :2368 ERROR1 ; A TB MISS TRAP OCCURRED.
U 1043, 0000,003D,0180,0800,0000,120A :2369 ERROR1 ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1044, 0000,003D,0180,0800,0000,1223 :2370 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1045, 0000,003D,0180,0800,0000,120A :2371 ERROR1 ; A UTRAP OCCURRED.
U 1046, 0000,003D,0180,0800,0000,120A :2372 ERROR1 ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1047, 0000,003C,0180,0800,0000,12A6 :2373 NOP
U 12A6, 0000,003C,0180,0A20,0010,12A7 :2374 ALU_R[4],CLK,UBCC ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 12A7, 0000,013C,0180,0800,0000,1156 :2375 Z?
U 1156, 0018,0000,0580,0AA0,0000,1144 :2376 =0 R[4],LA-K[.1],J/TBAFO ; IF NOT CONTINUE
U 1157, 0000,003C,0180,0800,0000,1158 :2377 NOP

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:2378 .PAGE "TEST A7 GROUP 0 COMPARATORS TEST"
:2379 *****
:2380 ++
:2381 TEST A7 GROUP 0 COMPARATORS TEST
:2382
:2383 TEST DESCRIPTION
:2384 THIS IS A TEST OF THE TB HIT/MISS COMPARATORS OF GROUP 0.
:2385 FIRST A TAG OF 0 IS MADE A HIT, THEN A 1 IS FLOATED ACROSS
:2386 A FIELD OF 0'S IN THE VA. EACH VA THUS PRODUCED SHOULD BE A
:2387 MISS IN THE TB. THEN EACH PATTERN PRODUCED
:2388 BY FLOATING A 1 ACROSS A FIELD OF 0'S IS MADE A HIT AND
:2389 THE VA ADDRESS OF 0 IS REFERENCED TO GET A MISS.
:2390 THE COMPLIMENT OF THE ABOVE PATTERNS IS ALSO TESTED (I.E.
:2391 ALL 1'S AND THE PATTERNS PRODUCED BY FLOATING A 0
:2392 ACROSS A FIELD OF 1'S.
:2393
:2394 ERROR DESCRIPTION
:2395 EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
:2396 OR GOT TBER1 (IF UNEXPECTED LTRAP OCCURRED)
:2397 ACTUAL TBER0
:2398 EXPECTED TIME OUT ADDRESS REGISTER
:2399 ACTUAL TIME OUT ADDRESS REGISTER
:2400 FLOATING PATTERN CURRENTLY IN USE
:2401 UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
:2402 FLAG UTRAP TYPE
:2403 ----
:2404 DE NO UTRAP OCCURRED
:2405 SE TB PARITY ERROR
:2406 9E TB MISS
:2407 CE TB PROTECTION ERROR
:2408 D6 TB MODIFY BIT ERROR
:2409 DA X PAGE UTRAP
:2410 DC UNALIGNED DATA UTRAP
:2411
:2412 --
:2413 *****
:2414 =0
:2415 TBHMO: NEWTST
:2416 RC[0F] K[.6]
:2417 =0 CALL,J7CSOFF ; TURN OFF THE CACHE AND SBI CYCLES
:2418 NOP
:2419 =0 D 0,CALL,J/DC.DE
:2420 R[0E] D ; SET UP THE UTRAP FLAG, R[0E]=DE
:2421 =0 CALL,J/TBWPTP ; GENERATE SOME TEST DATA PATTERNS
:2422 R[4] K[.10] D K[.10] ; R[4]=.10, A COUNTER
:2423 D D-R[.2],R[9] ALU ; R[9]=.E
:2424 //////////////////////////////////////
:2425 FIRST MAKE
:2426 VA=00000000
:2427 PTE=A40AAAAA
:2428 A HIT IN GROUP 0
:2429 CHECK THIS HIT IN GROUP 0.
:2430 THEN REFERENCE A TEST VA GENERATED BY FLOATING A 1 THROUGH 0'S
:2431 AND MAKE SURE THIS FLOATING TEST PATTERN IS A MISS.
:2432

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U 1158, 0000,003D,0180,0800,0000,11F2
U 1159, 0015,0038,D580,09F8,0000,115A
U 115A, 0000,003D,0180,0800,0000,1213
U 115B, 0000,003C,0180,0800,0000,115C
U 115C, 0F00,003D,0180,0800,0000,105C
U 115D, 0001,003C,0180,0AF0,0000,115E
U 115E, 0000,003D,0180,0800,0000,1269
U 115F, 0818,0038,6580,0AA0,0000,12A8
U 12A8, 0819,0000,0980,0AC8,0000,1160

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U 1160. 0000.003D.0180.0800.0000.1209 :2433 =0 ERLOOP
U 1161. 0010.0038.0180.0920.0200.12A9 :2434 TBHMOA: VA_RC[4] : VA=55554000
U 12A9. 0000.003C.0180.0918.0000.1162 :2435 LC_RC[3] : PTE=A4199999
U 1162. 0010.0039.0180.0AC0.00C0.10F0 :2436 =0 R[8] LC,CALL,J/TBWRB : WRITE THIS PATTERN INTO BOTH TB GROUPS
U 1163. 0018.0038.1980.09D0.0200.12AB :2437 ALU 0(K),VA_ALU,RC[0A]_ALU : VA=0
U 12AB. 0000.003C.0180.0930.0000.1164 :2438 LC_RC[6] : A40AAAAA
U 1164. 0010.0039.0180.0AC0.0000.10EE :2439 =0 R[8] LC,CALL,J/TBWRO : WRITE VA=0 INTO GROUP 0
U 1165. 0000.003C.0180.0940.0000.1050 :2440 LC_RC[8] : RC[8]=05555500 WHICH IS THE EXPECTED
:2441 : RELOCATION OF VA=0 AS IT
:2442 : WILL APPEAR IN THE TIME OUT ADDRESS REG.
:2443 =000 R[7] LC,CALL,J/HITO : READ VA=0, SHOULD HIT GROUP 0
U 1050. 0010.0039.0180.0AB8.0000.123F :2444 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 1051. 0000.003D.0180.0800.0000.120A :2445 ERROR1 : A TB MISS UTRAP OCCURRED
U 1052. 0000.003D.0180.0800.0000.120A :2446 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1053. 0000.003D.0180.0800.0000.120A :2447 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS OF VA=0
U 1054. 0000.003D.0180.0800.0000.1223 :2448 ERROR1 : A UTRAP OCCURRED
U 1055. 0000.003D.0180.0800.0000.120A :2449 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1056. 0000.003D.0180.0800.0000.120A :2450 NOP
U 1057. 0000.003C.0180.0800.0000.12AC :2451 D R[4] : GENERATE THE TEST ADDRESS
U 12AC. 0800.003C.0180.0A20.0000.12AD :2452 LAB R[9] : OF A 1 IN A FIELD OF ZEROES
U 12AD. 0000.003C.0180.0A48.0000.12AE :2453 ALU_LA[A+B]D,SC_ALU,RC[0A]_ALU
U 12AE. 001C.2014.0180.0AD0.0082.12AF :2454 ALU_NOT.MASK,VA_ALU,RC[5]_ALU : PUT THIS TEST PATTERN INTO THE VA
U 12AF. 0003.001C.0180.0AAB.0200.12B0 :2455 ALU_NOT.MASK,RC[0A]_ALU
U 12B0. 0003.001C.0180.09D0.0000.1004 :2456 =00 CALL,J/MISS : CHECK FOR A MISS AT VA=TEST PATTERN
U 1004. 0000.003D.0180.0800.0000.1234 :2457 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 1005. 0000.003D.0180.0800.0000.120A :2458 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 1006. 0000.003D.0180.0800.0000.120A :2459 NOP
U 1007. 0000.003C.0180.0800.0000.12B1 :2460 :////////////////////
:2461 : MAKE
:2462 : VA= TEST PATTERN GENERATED BY FLOATING A 1 THROUGH 0'S
:2463 : PTE=A4066666
:2464 : A HIT IN GROUP 0.
:2465 : CHECK THIS HIT, THEN REFERENCE VA=0 AND MAKE SURE IT IS A MISS
:2466 :
U 12B1. 0000.003C.0180.0A00.0000.12B2 :2467 LAB R[0] : R[0]=PTE=A4066666
U 12B2. 0000.003C.0180.0AC0.0000.12B3 :2468 R[8] LA
U 12B3. 0000.003C.0180.0A10.0000.1166 :2469 LAB R[2]
U 1166. 0000.003D.0180.0AB8.0000.10EE :2470 =0 R[7]_LA,CALL,J/TBWRO : WRITE FLOATING VA PATTERN INTO GROUP 0
U 1167. 0000.003C.0180.0800.0000.1060 :2471 NOP
U 1060. 0000.003D.0180.0800.0000.123F :2472 =000 CALL,J/HITO : CHECK FOR HIT IN GROUP 0
U 1061. 0000.003D.0180.0800.0000.120A :2473 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 1062. 0000.003D.0180.0800.0000.120A :2474 ERROR1 : A TB MISS UTRAP OCCURRED
U 1063. 0000.003D.0180.0800.0000.120A :2475 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1064. 0000.003D.0180.0800.0000.1223 :2476 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS OF THIS
:2477 : REFERENCE, WILL BE 03333300
:2478 : IN THE TIME OUT ADDRESS REGISTER
U 1065. 0000.003D.0180.0800.0000.120A :2479 ERROR1 : A UTRAP OCCURRED
U 1066. 0000.003D.0180.0800.0000.120A :2480 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1067. 0000.003C.0180.0800.0000.12B4 :2481 NOP
U 12B4. 0018.0038.1980.0800.0200.1018 :2482 ALU 0(K),VA_ALU : SET VA=0
U 1018. 0000.003D.0180.0800.0000.1234 :2483 =00 CALL,J/MISS : MAKE SURE VA=0 IS A MISS
U 1019. 0000.003D.0180.0800.0000.120A :2484 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 101A. 0000.003D.0180.0800.0000.120A :2485 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 101B. 0000.003C.0180.0800.0000.12B5 :2486 NOP
:2487 :////////////////////

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:2488 : MAKE
:2489 : VA=7FFFC000
:2490 : PTE=A40AAAAA
:2491 : A HIT IN GROUP 0. CHECK THIS HIT IN GROUP 0.
:2492 : THEN REFERENCE AN ADDRESS GENERATED BY FLOATING A 0 THROUGH
:2493 : A FIELD OF 1'S AND MAKE SURE THIS TEST PATTERN IS A MISS
:2494 :
:2495 : ALU R[0B],VA_ALU : VA=7FFFC000
:2496 : R[0A],LA
:2497 : LC R[6] : R[6]=PTE=A40AAAAA
:2498 : R[8],LC,CALL,J/TBWRO : WRITE VA=7FFFC000 INTO GROUP 0
:2499 : LC_R[8] : R[8]=05555500 WHICH WILL BE THE RELOCATED
:2500 : : ADDRESS AS IT APPEARS IN THE
:2501 : : TIME OUT ADDRESS REGISTER
:2502 : R[7],LC,CALL,J/HITO : CHECK HIT IN GROUP 0 AT VA=7FFFC000
:2503 : ERROR1 : A NON TB MISS UTRAP OCCURRED
:2504 : ERROR1 : A TB MISS UTRAP OCCURRED
:2505 : ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
:2506 : CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
:2507 : ERROR1 : A UTRAP OCCURRED
:2508 : ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
:2509 : NOP
:2510 : ALU R[0A],SC,ALU : GENERATE THE TEST PATTERN
:2511 : ALU_MASK,D,ALU,LAB R[0B] : OF A 0 IN A FIELD OF 1'S
:2512 : ALU_LA[AND]D,VA_ALU,R[5],ALU : PUT THE TEST PATTERN INTO THE VA
:2513 : ALU_LA[AND]D,R[0A],ALU
:2514 : =00 : CALL,J/MISS : MAKE SURE THIS TEST PATTERN IS A MISS
:2515 : ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
:2516 : ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
:2517 : NOP
:2518 : //////////////////////////////////////
:2519 : MAKE
:2520 : VA=TEST PATTERN GENERATED BY FLOATING A 0 THROUGH 1'S
:2521 : PTE=A4066666
:2522 : A HIT IN GROUP 0. CHECK THIS HIT.
:2523 : THEN REFERENCE VA=7FFFC000 AND MAKE SURE IT IS A MISS.
:2524 :
:2525 : LAB R[0] : R[0]=A4066666=PTE
:2526 : =0 : R[8],LA,CALL,J/TBWRO : WRITE THE FLOATING 0 PATTERN INTO GROUP 0
:2527 : LAB_R[2] : R[2]=03333300 WHICH IS THE RELOCATED
:2528 : : ADDRESS AS IT WILL APPEAR IN THE
:2529 : : TIME OUT ADDRESS REGISTER
:2530 : =000 : R[7],LA,CALL,J/HITO : CHECK THE TEST PATTERNS HIT IN GROUP 0
:2531 : ERROR1 : A NON TB MISS UTRAP OCCURRED
:2532 : ERROR1 : A TB MISS UTRAP OCCURRED
:2533 : ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
:2534 : CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
:2535 : ERROR1 : A UTRAP OCCURRED
:2536 : ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
:2537 : NOP
:2538 : ALU R[0B],VA_ALU : VA=7FFFC000
:2539 : =00 : CALL,J/MISS : MAKE SURE VA=7FFFC000 IS A MISS
:2540 : ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
:2541 : ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
:2542 : NOP

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U 12B5, 0000,003C,0180,0A58,0200,12B6
U 12B6, 0000,003C,0180,09D0,0000,12B7
U 12B7, 0000,003C,0180,0930,0000,1168
U 1168, 0010,0039,0180,0AC0,0000,10EE
U 1169, 0000,003C,0180,0940,0000,1068

U 1068, 0010,0039,0180,0AB8,0000,123F
U 1069, 0000,003D,0180,0800,0000,120A
U 106A, 0000,003D,0180,0800,0000,120A
U 106B, 0000,003D,0180,0800,0000,120A
U 106C, 0000,003D,0180,0800,0000,1223
U 106D, 0000,003D,0180,0800,0000,120A
U 106E, 0000,003D,0180,0800,0000,120A
U 106F, 0000,003C,0180,0800,0000,12B8
U 12B8, 0000,003C,0180,0A50,0082,12B9
U 12B9, 0800,0038,0180,0A58,0000,12BA
U 12BA, 001C,2034,0180,0AAB,0200,12BB
U 12BB, 001C,2034,0180,09D0,0000,1038
U 1038, 0000,003D,0180,0800,0000,1234
U 1039, 0000,003D,0180,0800,0000,120A
U 103A, 0000,003D,0180,0800,0000,120A
U 103B, 0000,003C,0180,0800,0000,12BC

U 12BC, 0000,003C,0180,0A00,0000,116A
U 116A, 0000,003D,0180,0AC0,0000,10EE
U 116B, 0000,003C,0180,0A10,0000,1070

U 1070, 0000,003D,0180,0AB8,0000,123F
U 1071, 0000,003D,0180,0800,0000,120A
U 1072, 0000,003D,0180,0800,0000,120A
U 1073, 0000,003D,0180,0800,0000,120A
U 1074, 0000,003D,0180,0800,0000,1223
U 1075, 0000,003D,0180,0800,0000,120A
U 1076, 0000,003D,0180,0800,0000,120A
U 1077, 0000,003C,0180,0800,0000,12BD
U 12BD, 0000,003C,0180,0A58,0200,1048
U 1048, 0000,003D,0180,0800,0000,1234
U 1049, 0000,003D,0180,0800,0000,120A
U 104A, 0000,003D,0180,0800,0000,120A
U 104B, 0000,003C,0180,0800,0000,12BE

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:2543 :////////////////////////
:2544 : MAKE SURE GROUP 1 IS STILL INTACT.
:2545 ALU R[4],VA_ALU ; R[4]=55554000
:2546 R[0A],LC
:2547 LC R[5] ; R[5]=0CCCC80, THE RELOCATED ADDRESS
U 12BE, 0010,0038,0180,0920,0200,12BF :2548 =000 R[7],LC,CALL,J/HIT1 ; CHECK FOR HIT IN GROUP 1
U 12BF, 0010,0038,0180,09D0,0000,12C0 :2549 ERROR1 ; A NON TB MISS UTRAP OCCURRED
U 12C0, 0000,003C,0180,0928,0000,1080 :2550 ERROR1 ; A TB MISS UTRAP OCCURRED
U 1080, 0010,0039,0180,0AB8,0000,124C :2551 ERROR1 ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1081, 0000,003D,0180,0800,0000,120A :2552 CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
U 1082, 0000,003D,0180,0800,0000,120A :2553 ERROR1 ; A UTRAP OCCURRED
U 1083, 0000,003D,0180,0800,0000,120A :2554 ERROR1 ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1084, 0000,003D,0180,0800,0000,1223 :2555 NOP
U 1085, 0000,003D,0180,0800,0000,120A :2556 ALU_R[4],CLK.UBCC ; SEE IF ALL FLOATING TEST PATTERNS HAVE
U 1086, 0000,003D,0180,0800,0000,120A :2557 Z? ; BEEN TRIED.
U 1087, 0000,003C,0180,0800,0000,12C1 :2558 =0 R[4],LA-K[.1],J/TBHM0A ; IF NOT CONTINUE
U 12C1, 0000,003C,0180,0A20,0010,12C2 :2559 NOP
U 12C2, 0000,013C,0180,0800,0000,116C
U 116C, 0018,0000,0580,0AA0,0000,1161
U 116D, 0000,003C,0180,0800,0000,116E

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U 116E.	0000,003D,0180,0800,0000,11F2	:2597
U 116F.	001B,0038,D580,09FB,0000,1170	:2598
U 1170.	0000,003D,0180,0800,0000,1213	:2599
U 1171.	0000,003C,0180,0800,0000,1172	:2600
U 1172.	0F00,003D,0180,0800,0000,105C	:2601
U 1173.	0001,003C,0180,0AF0,0000,1174	:2602
U 1174.	0000,003D,0180,0800,0000,1269	:2603
U 1175.	0818,0038,6580,0AA0,0000,12C3	:2604
U 12C3.	0819,0000,0980,0ACB,0000,1176	:2605
		:2606
		:2607
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U 1176.	0000,003D,0180,0800,0000,1209	:2614

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.PAGE      "TEST A8"      GROUP 1 COMPARATORS TEST"
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++
TEST  A8      GROUP 1 COMPARATORS TEST

TEST DESCRIPTION
THIS IS A TEST OF THE TB HIT/MISS COMPARATORS OF GROUP 1.
FIRST A TAG OF 0 IS MADE A HIT, THEN A 1 IS FLOATED ACROSS
A FIELD OF 0'S IN THE VA. EACH VA THUS PRODUCED SHOULD BE A
MISS IN THE TB. THEN EACH PATTERN PRODUCED
BY FLOATING A 1 ACROSS A FIELD OF 0'S IS MADE A HIT AND
THE VA ADDRESS OF 0 IS REFERENCED TO GET A MISS.
THE COMPLIMENT OF THE ABOVE PATTERNS IS ALSO TESTED (I.E.
ALL 1'S AND THE PATTERNS PRODUCED BY FLOATING A 0
ACROSS A FIELD OF 1'S.

ERROR DESCRIPTION
EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
OR GOT TBER1 (IF UNEXPECTED LTRAP OCCURRED)
ACTUAL TBER0
EXPECTED TIME OUT ADDRESS REGISTER
ACTUAL TIME OUT ADDRESS REGISTER
FLOATING PATTERN CURRENTLY IN USE
UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
      FLAG              UTRAP TYPE
      ----              -
      DE              NO UTRAP OCCURRED
      5E              TB PARITY ERROR
      9E              TB MISS
      CE              TB PROTECTION ERROR
      D6              TB MODIFY BIT ERROR
      DA              X PAGE UTRAP
      DC              UNALIGNED DATA UTRAP

--
*****
=0
TBHM1:  NEWTST
        R[OE],K[.6]
=0      CALL,J7CSOFF          ; TURN OFF THE CACHE AND SBI CYCLES
        NOP
=0      D 0,CALL,J/DC.DE
        R[OE],D              ; SET UP THE UTRAP FLAG, R[OE]=DE
=0      CALL,J/TBWPTP        ; GENERATE SOME TEST DATA PATTERNS
        R[4],K[.10],D K[.10] ; R[4]=.10, A COUNTER
        D D-R[.2],R[9],ALU   ; R[9]=.E
://////7////////7/////////

FIRST MAKE
        VA=00000000
        PTE=A40AAAAA
A HIT IN GROUP 1 AND CHECK THIS HIT.
THEN REFERENCE VA= A TEST PATTERN GENERATED BY FLOATING A 1 THROUGH
A FIELD OF ZEROES AND MAKE SURE THIS TEST PATTERN IS A MISS.
=0      ERLOOP

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U 1177, 0010,0038,0180,0920,0200,12C4 :2615 TBHM1A: VA_RC[4] : VA=55554000
U 12C4, 0000,003C,0180,0918,0000,1178 :2616 LC_RC[3] : RC[3]=PTE=A4199999
U 1178, 0010,0039,0180,0AC0,0000,10F0 :2617 =0 RC[8] LC, CALL, J/TBWRB : MAKE VA=55554000 A HIT IN BOTH GROUPS
U 1179, 0018,0038,1980,09D0,0200,12C5 :2618 ALU 0(K), VA_ALU, RC[0A]_ALU : VA=0
U 12C5, 0000,003C,0180,0930,0000,117A :2619 LC_RC[6] : RC[6]=PTE=A40AAAAA
U 117A, 0010,0039,0180,0AC0,0000,10E8 :2620 =0 RC[8] LC, CALL, J/TBWR1 : WRITE VA=0 INTO GROUP 1
U 117B, 0000,003C,0180,0940,0000,1088 :2621 LC_RC[8] : RC[8]=05555500 THE EXPECTED RELOCATED
:2622 : ADDRESS AS IT WILL APPEAR IN THE
:2623 : TIME OUT ADDRESS REGISTER
U 1088, 0010,0039,0180,0AB8,0000,124C :2624 =000 RC[7] LC, CALL, J/HIT1 : CHECK A HIT IN GROUP 1 AT VA=0
U 1089, 0000,003D,0180,0800,0000,120A :2625 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 108A, 0000,003D,0180,0800,0000,120A :2626 ERROR1 : A TB MISS UTRAP OCCURRED
U 108B, 0000,003D,0180,0800,0000,120A :2627 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 108C, 0000,003D,0180,0800,0000,1223 :2628 CALL, J/RELCHK : CHECK THE RELOCATED ADDRESS
U 108D, 0000,003D,0180,0800,0000,120A :2629 ERROR1 : A UTRAP OCCURRED
U 108E, 0000,003D,0180,0800,0000,120A :2630 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 108F, 0000,003C,0180,0800,0000,12C6 :2631 NOP
U 12C6, 0800,003C,0180,0A20,0000,12C7 :2632 D RC[4] : GENERATE THE TEST ADDRESS
U 12C7, 0000,003C,0180,0A48,0000,12C8 :2633 LAB RC[9] : OF A 1 IN A FIELD OF 0'S
U 12C8, 001C,2014,0180,0AD0,0082,12C9 :2634 ALU LA[A+B]D, SC_ALU, RC[0A]_ALU
U 12C9, 0003,001C,0180,0AAB,0200,12CA :2635 ALU NOT.MASK, VA_ALU, RC[5]_ALU : PUT THIS TEST PATTERN INTO THE VA
U 12CA, 0003,001C,0180,09D0,0000,1078 :2636 ALU NOT.MASK, RC[0A]_ALU
U 1078, 0000,003D,0180,0800,0000,1234 :2637 =00 CALL, J/MISS : MAKE SURE THIS TEST PATTERN IS A MISS
U 1079, 0000,003D,0180,0800,0000,120A :2638 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 107A, 0000,003D,0180,0800,0000,120A :2639 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 107B, 0000,003C,0180,0800,0000,12CB :2640 NOP
:2641 :////////////////////
:2642 : MAKE
:2643 : VA= TEST PATTERN GENERATED BY FLOATING A 1 THROUGH A FIELD OF 0'S
:2644 : PTE=A4066666
:2645 : A HIT IN GROUP 1 AND CHECK THIS HIT.
:2646 : THEN REFERENCE VA=0 AND MAKE SURE THIS ADDRESS IS A MISS
:2647 :
U 12CB, 0000,003C,0180,0A00,0000,12CC :2648 LAB RC[0] : RC[0]=PTE=A4066666
U 12CC, 0000,003C,0180,0AC0,0000,12CD :2649 RC[8] LA
U 12CD, 0000,003C,0180,0A10,0000,1180 :2650 LAB RC[2]
U 1180, 0000,003D,0180,0AB8,0000,10E8 :2651 =0 RC[7] LA, CALL, J/TBWR1 : WRITE FLOATING VA PATTERN INTO GROUP 1
U 1181, 0000,003C,0180,0800,0000,1090 :2652 NOP
U 1090, 0000,003D,0180,0800,0000,124C :2653 =000 CALL, J/HIT1 : CHECK THIS HIT IN GROUP 1
U 1091, 0000,003D,0180,0800,0000,120A :2654 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 1092, 0000,003D,0180,0800,0000,120A :2655 ERROR1 : A TB MISS UTRAP OCCURRED
U 1093, 0000,003D,0180,0800,0000,120A :2656 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1094, 0000,003D,0180,0800,0000,1223 :2657 CALL, J/RELCHK : CHECK THE RELOCATED ADDRESS
U 1095, 0000,003D,0180,0800,0000,120A :2658 ERROR1 : A UTRAP OCCURRED
U 1096, 0000,003D,0180,0800,0000,120A :2659 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1097, 0000,003C,0180,0800,0000,12CE :2660 NOP
U 12CE, 0018,0038,1980,0800,0200,1098 :2661 ALU 0(K), VA_ALU : SET VA=0
U 1098, 0000,003D,0180,0800,0000,1234 :2662 =00 CALL, J/MISS : MAKE SURE VA=0 IS A MISS
U 1099, 0000,003D,0180,0800,0000,120A :2663 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 109A, 0000,003D,0180,0800,0000,120A :2664 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 109B, 0000,003C,0180,0800,0000,12CF :2665 NOP
:2666 :////////////////////
:2667 : MAKE
:2668 : VA=7FFFC000
:2669 : PTE=A40AAAAA

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:2670 : A HIT IN GROUP 1 AND CHECK THAT HIT.
:2671 : THEN REFERENCE VA= A PATTERN GENERATED BY FLOATING A 0 THROUGH A
:2672 : FIELD OF 1'S AND MAKE SURE THIS TEST PATTERN IS A MISS
:2673 :
U 12CF, 0000,003C,0180,0A58,0200,12D0 :2674 ALU R[0B],VA_ALU : VA=7FFFC000
U 12D0, 0000,003C,0180,09D0,0000,12D1 :2675 RC[0A] LA
U 12D1, 0000,003C,0180,0930,0000,1182 :2676 LC RC[6] : RC[6]=PTE=A40AAAAA
U 1182, 0010,0039,0180,0AC0,0000,10E8 :2677 =0 R[8] LC,CALL,J/TBWR1 : WRITE VA=7FFFC000 INTO GROUP 1
U 1183, 0000,003C,0180,0940,0000,10A0 :2678 LC RC[8]
U 10A0, 0010,0039,0180,0AB8,0000,124C :2679 =000 R[7] LC,CALL,J/HIT1 : CHECK FOR A HIT IN GROUP 1 AT VA=7FFFC000
U 10A1, 0000,003D,0180,0800,0000,120A :2680 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 10A2, 0000,003D,0180,0800,0000,120A :2681 ERROR1 : A TB MISS UTRAP OCCURRED
U 10A3, 0000,003D,0180,0800,0000,120A :2682 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10A4, 0000,003D,0180,0800,0000,1223 :2683 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
U 10A5, 0000,003D,0180,0800,0000,120A :2684 ERROR1 : A UTRAP OCCURRED
U 10A6, 0000,003D,0180,0800,0000,120A :2685 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10A7, 0000,003C,0180,0800,0000,12D2 :2686 NOP
U 12D2, 0000,003C,0180,0A50,0082,12D3 :2687 ALU R[0A],SC ALU : GENERATE THE TEST PATTERN
U 12D3, 0800,0038,0180,0A58,0000,12D4 :2688 ALU_MASK,D A[0,LAB R[0B]] : A 0 IN A FIELD OF 1'S
U 12D4, 001C,2034,0180,0AA8,0200,12D5 :2689 ALU_LA[AND]D,VA_ALU,R[5]_ALU : PUT THE TEST PATTERN INTO THE VA
U 12D5, 001C,2034,0180,09D0,0000,10D8 :2690 ALU_LA[AND]D,RC[0A]_ALU
U 10D8, 0000,003D,0180,0800,0000,1234 :2691 =00 CAL,J/MISS : MAKE SURE IT IS A MISS IN THE TB
U 10D9, 0000,003D,0180,0800,0000,120A :2692 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 10DA, 0000,003D,0180,0800,0000,120A :2693 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10DB, 0000,003C,0180,0800,0000,12D6 :2694 NOP
:2695 :////////////////////
:2696 : MAKE
:2697 : VA= TEST PATTERN GENERATED BY FLOATING A 0 THROUGH A FIELD OF 1'S
:2698 : PTE=A4066666
:2699 : A HIT IN GROUP 1 AND CHECK THIS HIT.
:2700 : THEN REFERENCE VA=7FFFC000 AND MAKE SURE THIS ADDRESS IS A TB MISS
:2701 :
U 12D6, 0000,003C,0180,0A00,0000,1184 :2702 LAB R[0]
U 1184, 0000,003D,0180,0AC0,0000,10E8 :2703 =0 R[8] LA,CALL,J/TBWR1 : WRITE THE VA=TEST PATTERN INTO GROUP 1
U 1185, 0000,003C,0180,0A10,0000,10A8 :2704 LAB R[2]
U 10A8, 0000,003D,0180,0AB8,0000,124C :2705 =000 R[7] LA,CALL,J/HIT1 : CHECK THIS HIT IN GROUP 1
U 10A9, 0000,003D,0180,0800,0000,120A :2706 ERROR1 : A NON TB MISS UTRAP OCCURRED
U 10AA, 0000,003D,0180,0800,0000,120A :2707 ERROR1 : A TB MISS UTRAP OCCURRED
U 10AB, 0000,003D,0180,0800,0000,120A :2708 ERROR1 : NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10AC, 0000,003D,0180,0800,0000,1223 :2709 CALL,J/RELCHK : CHECK THE RELOCATED ADDRESS
U 10AD, 0000,003D,0180,0800,0000,120A :2710 ERROR1 : A UTRAP OCCURRED
U 10AE, 0000,003D,0180,0800,0000,120A :2711 ERROR1 : NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10AF, 0000,003C,0180,0800,0000,12D7 :2712 NOP
U 12D7, 0000,003C,0180,0A58,0200,10DC :2713 =00 ALU R[0B],VA_ALU : VA=7FFFC000
U 10DC, 0000,003D,0180,0800,0000,1234 :2714 CAL,J/MISS : VA SHOULD NOW BE A MISS
U 10DD, 0000,003D,0180,0800,0000,120A :2715 ERROR1 : NO UTRAP OCCURRED (EXPECTED TB MISS)
U 10DE, 0000,003D,0180,0800,0000,120A :2716 ERROR1 : UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10DF, 0000,003C,0180,0800,0000,12D8 :2717 NOP
:2718 :////////////////////
:2719 : MAKE SURE GROUP 0 IS STILL INTACT.
U 12D8, 0010,0038,0180,0920,0200,12D9 :2720 ALU RC[4],VA_ALU : VA=55554000
U 12D9, 0010,0038,0180,09D0,0000,12DA :2721 RC[0A] LC
U 12DA, 0000,003C,0180,0928,0000,1080 :2722 LC RC[5]
U 1080, 0010,0039,0180,0AB8,0000,123F :2723 =000 R[7] LC,CALL,J/HIT0 : MAKE SURE VA=55554000 IS A HIT IN GROUP 0
U 10B1, 0000,003D,0180,0800,0000,120A :2724 ERROR1 : A NON TB MISS UTRAP OCCURRED

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U	1082.	0000.	003D.	0180.	0800.	0000.	120A	:2725
U	1083.	0000.	003D.	0180.	0800.	0000.	120A	:2726
U	1084.	0000.	003D.	0180.	0800.	0000.	1223	:2727
U	1085.	0000.	003D.	0180.	0800.	0000.	120A	:2728
U	1086.	0000.	003D.	0180.	0800.	0000.	120A	:2729
U	1087.	0000.	003C.	0180.	0800.	0000.	12DB	:2730
U	12DB.	0000.	003C.	0180.	0A20.	0010.	12DC	:2731
U	12DC.	0000.	013C.	0180.	0800.	0000.	1186	:2732
U	1186.	0018.	0000.	0580.	0AA0.	0000.	1177	:2733
U	1187.	0000.	003C.	0180.	0800.	0000.	1188	:2734

$$= 0$$

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ERROR1      ; A TB MISS UTRAP OCCURRED
ERROR1      ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
CALL,J/RELCHK      ; CHECK THE RELOCATED ADDRESS
ERROR1      ; A UTRAP OCCURRED
ERROR1      ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
NOP
ALU_R[4],CLK.UBCC      ; HAVE ALL PATTERNS BEEN TRIED?
Z?
R[4]_LA-K[.1],J/TBHM1A ; IF NOT CONTINUE.
NOP

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U 1188, 0000,003D,0180,0800,0000,11F2
U 1189, 0018,0038,5D80,09F8,0000,118A
U 118A, 0000,003D,0180,0800,0000,1213
U 118B, 0000,003C,0180,0800,0000,118C
U 118C, 0000,003D,0180,0800,0000,1269
U 118D, 0000,003C,0180,0800,0000,118E
U 118E, 0F00,003D,0180,0800,0000,105C
U 118F, 0001,003C,0180,0A00,0000,12DD
U 12DD, 0018,0038,5D80,0A98,0000,12DE
U 12DE, 0018,0038,6580,0AA0,0000,1190
U 1190, 0818,0039,6580,0800,0000,1251
U 1191, 0501,003C,0180,0AA8,0000,12DF
U 12DF, 0001,003C,0180,0A80,0000,12E0
U 12E0, 0010,0038,0180,0908,0200,12E1
U 12E1, 0010,0038,0180,09F0,0000,12E2
U 12E2, 0000,003C,0180,0900,0000,12E3
U 12E3, 0010,0038,0180,09E8,0000,1192
U 1192, 0010,0039,0180,0AC0,0000,10F0
U 1193, 0000,003C,0180,0800,0000,1194

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.PAGE "TEST A9 TB PARITY LOGIC TEST"
*****
++
TEST A9 TB PARITY LOGIC TEST

TEST DESCRIPTION
THIS IS A TEST OF THE TB PARITY LOGIC USING THE MAINTENANCE
FEATURES IN TBER0. A PARITY ERROR IS FORCED AT EACH PARITY
CHECKER OF EACH GROUP. THIS SHOULD RESULT IN A UTRAP
AND THE APPROPRIATE BITS IN TBER1 SHOULD GET SET.

ERROR DESCRIPTION
ADDRESS WRITTEN, VA
DATA WRITTEN, PTE
EXPECTED TBER1
GOT TBER1
WROTE TBER0
READ TBER0
UTRAP FLAG

FLAG UTRAP TYPE
-----
DE NO UTRAP OCCURRED
SE TB PARITY ERROR
9E TB MISS
CE TB PROTECTION ERROR
D6 TB MODIFY BIT ERROR
DA X PAGE UTRAP
DC UNALIGNED DATA UTRAP

--
*****
=0
TBP: NEWTST
RC[0F],K[.7]
=0 CALL,J7CSOFF ; TURN OFF THE CACHE AND SBI CYCLES
NOP
=0 CALL,J/TBWPTP ; GENERATE SOME TEST DATA PATTERNS
NOP
=0 D 0,CALL,J/DC.DE
R[0E] D ; SET UP THE UTRAP FLAG, R[0E]=DE
R[3] R[.6] ; R[3]=6
R[4] K[.10] ; R[4]=10(HEX)
=0 D K[.10],CALL,J/DC0
R[5] D,D_D.LEFT,S1/ZERO ; R[5]=100(HEX)
R[6] D ; R[6]=200(HEX)
VA R[1] ; VA=4CCCC000
RC[0E] LC
LC RC[0] ; RC[0]=PTE=A4155555
RC[0D] LC
=0 R[8] LC,CALL,J/TBWRB ; WRITE VA=4CCCC000 INTO BOTH GROUPS
NOP
:////////////////////////
: SUBTEST 1
: FIRST TEST THE ADDRESS PARITY LOGIC.
:-

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U 1194, 0000,003D,0180,0800,0000,120E :2790
U 1195, 0000,003C,0180,0800,0000,1196 :2791
U 1196, 0000,003D,0180,0800,0000,1209 :2792
U 1197, 0000,003C,4D80,3C00,0000,12E4 :2793
U 12E4, 0000,003C,4DF0,2C00,0000,12E5 :2794
U 12E5, 0019,2024,49C0,0800,0000,12E6 :2795
U 12E6, 0003,003C,0180,09E0,0000,12E7 :2796
U 12E7, 0001,203C,0180,09D8,0000,12E8 :2797
U 12E8, 0001,203C,0180,0800,0010,12E9 :2798
U 12E9, 0000,013C,0180,0800,0000,1198 :2799
U 1198, 0000,003D,0180,0800,0000,120A :2800
U 1199, 0F00,003C,0180,0800,0000,12EA :2801
U 12EA, 0000,003C,4980,3C00,0000,12EB :2802
U 12EB, 0000,003C,49F0,2C00,0000,12EC :2803
U 12EC, 0019,2034,8DC0,0800,0000,12ED :2804
U 12ED, 0003,003C,0180,09D0,0000,12EE :2805
U 12EE, 0001,203C,0180,09C8,0000,12EF :2806
U 12EF, 0001,203C,0180,0800,0010,12F0 :2807
U 12F0, 0000,013C,0180,0800,0000,119A :2808
U 119A, 0000,003D,0180,0800,0000,120A :2809
U 119B, 0800,003C,0180,0A20,0000,12F1 :2810
U 12F1, 0819,0014,0580,0800,0000,12F2 :2811
U 12F2, 0000,003C,4980,3C00,0000,12F3 :2812
U 12F3, 0000,003C,49F0,2C00,0C00,12F4 :2813
U 12F4, 0019,2034,8DC0,0800,0000,12F5 :2814
U 12F5, 0001,003C,0180,09D0,0000,12F6 :2815
U 12F6, 0001,203C,0180,09C8,0000,12F7 :2816
U 12F7, 001D,2000,0180,0800,0010,12F8 :2817
U 12F8, 0000,013C,0180,0800,0000,119C :2818
U 119C, 0000,003D,0180,0800,0000,120A :2819
U 119D, 0000,003C,0180,0A70,0000,12F9 :2820
U 12F9, 0000,003C,0180,52F8,0000,12FA :2821
U 12FA, 0800,003C,0180,0A78,0000,12FB :2822
U 12FB, 0018,0038,1980,0AF8,0000,12FC :2823
U 12FC, 0001,003C,0180,09C0,0000,12FD :2824
U 12FD, 0000,003C,0180,0A70,0000,12FE :2825
U 12FE, 001C,2000,0180,0800,0010,12FF :2826
U 12FF, 0000,013C,0180,0800,0000,119E :2827
U 119E, 0000,003C,0180,0800,0000,1300 :2828
U 119F, 0000,003D,0180,0800,0000,120A :2829
U 1300, 0000,003C,5D80,0800,0084,7301 :2830
U 1301, 0001,0024,0180,0800,0010,1302 :2831
U 1302, 0000,013C,0180,0800,0000,11A0 :2832
U 11A0, 0000,003D,0180,0800,0000,120A :2833
U 11A1, 0000,003C,0180,0800,0000,1303 :2834
U 1303, 0800,003C,4DF0,2E28,0000,1304 :2835
U 1304, 0019,2024,49C0,0800,0000,1305 :2836
U 1305, 081C,2030,0180,0A30,0000,1306 :2837
U 1306, 0001,003C,0180,09E0,0000,1307 :2838
U 1307, 0001,203C,0180,09D8,0000,1308 :2839
U 1308, 001D,2000,0180,0800,0010,1309 :2840
U 1309, 0000,013C,0180,0800,0000,11A2 :2841
U 11A2, 0000,003D,0180,0800,0000,120A :2842

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=0 SUBTEST
NOP
=0 ERLOOP
TBPAR0: ID[TBER1],D ; THIS SHOULD CLEAR TBER1<31:8>
Q ID[TBER1] ; READ IT BACK
ALU Q[ANDNOT]K[.FF],Q,ALU ; MASK OFF IPA ERROR BITS
RC[0C],0
RC[0B],0
ALU_Q,CLK,UBCC ; SEE IF TBER1<31:8> WAS CLEAR.
Z?
=0 ERROR1 ; TBER1<31:8> NOT CLEARED BY REFERENCE.
D 0
ID[TBER0],D ; CLEAR TBER0<4:0>.
Q ID[TBER0] ; SEE IF TBER0<4:0> WERE CLEARED
ALU Q[AND]K[.1F],Q,ALU
RC[0A],0
RC[9],0
ALU_Q,CLK,UBCC ; SEE IF TBER0<4:0> GOT CLEARED.
Z?
=0 ERROR1 ; CAN WRITE (OR READ) 0'S IN TBER0<4:0>.
TBPAR1: D_R[4]
D-D+K[.1]
ID[TBER0],D ; SET MME AND MAINTENANCE BITS TO
; FORCE A PARITY ERROR.
Q ID[TBER0] ; SEE IF BITS GOT SET.
ALU Q[AND]K[.1F],Q,ALU
RC[0A],D
RC[9],0
ALU_Q=D,CLK,UBCC
Z?
=0 ERROR1 ; CAN'T SET BITS<4:0> (OR READ REG.) IN TBER0.
LAB R[0E]
RC[0F],LA,FS/MCT,MCT/READ,V.WCHK ; THIS SHOULD TRAP BECAUSE OF TB PARITY.
D_R[0F] ; CHECK UTRAP FLAG FOR TRAP.
ALU Q(K),R[0F],ALU
RC[8],D
LAB R[0E] ; SEE IF A TRAP OCCURRED.
ALU_LA[A-B]D,CLK,UBCC
Z?
=0 J/TBPAR2 ; OK TRAPPED. GO SEE IF UTRAP WAS TB PARITY
ERROR1 ; NO TRAP OCCURRED!
TBPAR2: SC K[.7] ; SEE IF THE TRAP WAS A TB PARITY ERROR.
ALU_D.ANDNOT.MASK,CLK,UBCC
Z?
=0 ERROR1 ; A TRAP WHICH WAS NOT A TB PARITY ERROR
; TRAP OCCURRED WHILE FORCING TB PARITY ERRORS.
NOP ; OK
Q ID[TBER1],D_R[5] ; SEE IF TBER1 IS SET CORRECTLY.
ALU Q[ANDNOT]K[.FF],Q,ALU ; MASK OFF IPA ERROR BITS.
LAB_R[6],ALU_LA[OR]D,D,ALU
RC[0C],D
RC[0B],0
ALU_Q=D,CLK,UBCC
Z?
=0 ERROR1 ; TBER1<31:8> NOT SET CORRECTLY.

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U 11A3, 0000,003C,4D80,3C00,0000,130A :2845
U 130A, 0000,003C,4DF0,2C00,0000,130B :2846
U 130B, 0019,2024,49C0,0800,0000,130C :2847
U 130C, 0003,003C,0180,09E0,0000,130D :2848
U 130D, 0001,203C,0180,09D8,0000,130E :2849
U 130E, 0001,203C,0180,0800,0010,130F :2850
U 130F, 0000,013C,0180,0800,0000,11A4 :2851
U 11A4, 0000,003D,0180,0800,0000,120A :2852
U 11A5, 0F00,003C,0180,0800,0000,1310 :2853
U 1310, 0000,003C,4980,3C00,0000,1311 :2854
U 1311, 0000,003C,49F0,2C00,0000,1312 :2855
U 1312, 0019,2034,8DC0,0800,0000,1313 :2856
U 1313, 0003,003C,0180,09D0,0000,1314 :2857
U 1314, 0001,203C,0180,09C8,0000,1315 :2858
U 1315, 0001,203C,0180,0800,0010,1316 :2859
U 1316, 0000,013C,0180,0800,0000,11A6 :2860
U 11A6, 0000,003D,0180,0800,0000,120A :2861
U 11A7, 0000,003C,0180,0A20,0000,1317 :2862
U 1317, 0018,0014,0980,0AA0,0000,1318 :2863
U 1318, 0000,003C,0180,0A30,0000,1319 :2864
U 1319, 0020,003C,0180,0AB0,0000,131A :2865
U 131A, 0000,003C,0180,0A18,0000,131B :2866
U 131B, 0018,0000,0580,0A98,0010,131C :2867
U 131C, 0000,013C,0180,0800,0000,11A8 :2868
U 11A8, 0000,003C,0180,0800,0000,119B :2869
U 11A9, 0000,003C,0180,0800,0000,11AA :2870

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ID[TBER1] D ; THIS SHOULD CLEAR TBER1<31:8>
Q ID[TBER1] ; SEE IF TBER1<31:8> WAS CLEARED.
A[U Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF IPA ERROR BITS
RC[0C]_0
RC[0B]_0
ALU_Q,CLK.UBCC
Z?
=0 ERROR1 ; REFERENCE TO TBER1 DIDN'T CLEAR BITS<31:8>.
D 0
ID[TBER0] D ; SEE IF TBER0<4:0> CAN BE CLEARED.
Q ID[TBER0]
A[U Q[AND]K[.1F],Q_ALU
RC[0A]_0
RC[9]_0
ALU_Q,CLK.UBCC
Z?
=0 ERROR1 ; CAN'T WRITE AND READ 0'S IN TBER0<4:0>.
LAB R[4] ; SEE IF ALL THE ADDRESS MEMORY PARITY
R[4] LA+K[.2] ; LOGIC HAS BEEN TESTED.
LAB R[6] ; IF NOT INCREMENT THE MAINTENANCE
ALU_LA,SHF/LEFT,S1/ZERO,R[6],SHF ; PATTERN TO BE PUT IN TBER0<4:1>
LAB R[3]
R[3] LA-K[.1],CLK.UBCC
Z?
=0 J/TBPAR1
NOP

```

////////////////////////////////////

SUBTEST 2
NOW TEST THE DATA MEMORY PARITY LOGIC.

```

=0 SUBTEST
R[3] K[.6] ; R[6]=6
R[4] K[.4] ; R[4]=4
=0 ERLOOP
TBPAR3: ID[TBER1] D ; THIS SHOULD CLEAR TBER1<31:8>
Q ID[TBER1] ; SEE IF TBER1<31:8> ARE CLEAR
A[U Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF THE IPA ERROR BITS
RC[0C]_0
RC[0B]_0
ALU_Q,CLK.UBCC ; SEE IF TBER1<31:8> WAS CLEAR.
Z?
=0 ERROR1 ; TBER1<31:8> NOT CLEARED BY REFERENCE.
D 0
ID[TBER0] D ; CLEAR TBER0.
Q ID[TBER0]
A[U Q[AND]K[.1F],Q_ALU
RC[0A]_0
RC[9]_0
ALU_Q,CLK.UBCC ; SEE IF TBER0<4:0> GOT CLEARED.
Z?
=0 ERROR1 ; CAN WRITE (OR READ) 0'S IN TBER0<4:0>.
TBPAR4: D R[4]
D-D+K[.1]
ID[TBER0]_D ; SET MME AND MAINTENANCE BITS TO

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U 11AA, 0000,003D,0180,0800,0000,120E :2876
U 11AB, 0018,0038,D580,0A98,0000,131D :2877
U 131D, 0018,0038,1180,0AA0,0000,11AC :2878
U 11AC, 0000,003D,0180,0800,0000,1209 :2879
U 11AD, 0000,003C,4D80,3C00,0000,131E :2880
U 131E, 0000,003C,4DF0,2C00,0000,131F :2881
U 131F, 0019,2024,49C0,0800,0000,1320 :2882
U 1320, 0003,003C,0180,09E0,0000,1321 :2883
U 1321, 0001,203C,0180,09D8,0000,1322 :2884
U 1322, 0001,203C,0180,0800,0010,1323 :2885
U 1323, 0000,013C,0180,0800,0000,11AE :2886
U 11AE, 0000,003D,0180,0800,0000,120A :2887
U 11AF, 0F00,003C,0180,0800,0000,1324 :2888
U 1324, 0000,003C,4980,3C00,0000,1325 :2889
U 1325, 0000,003C,49F0,2C00,0000,1326 :2890
U 1326, 0019,2034,8DC0,0800,0000,1327 :2891
U 1327, 0003,003C,0180,09D0,0000,1328 :2892
U 1328, 0001,203C,0180,09C8,0000,1329 :2893
U 1329, 0001,203C,0180,0800,0010,132A :2894
U 132A, 0000,013C,0180,0800,0000,11B0 :2895
U 11B0, 0000,003D,0180,0800,0000,120A :2896
U 11B1, 0800,003C,0180,0A20,0000,132B :2897
U 132B, 0819,0014,0580,0800,0000,132C :2898
U 132C, 0000,003C,4980,3C00,0000,132D :2899

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:2900
U 132D, 0000,003C,49F0,2C00,0000,132E :2901
U 132E, 0019,2034,8DC0,0800,0000,132F :2902
U 132F, 0001,003C,0180,09D0,0000,1330 :2903
U 1330, 0001,203C,0180,09C8,0000,1331 :2904
U 1331, 001D,2000,0180,0800,0010,1332 :2905
U 1332, 0000,013C,0180,0800,0000,11B2 :2906
U 11B2, 0000,003D,0180,0800,0000,120A :2907
U 11B3, 0000,003C,0180,0A70,0000,1333 :2908
U 1333, 0000,003C,0180,52F8,0000,1334 :2909
U 1334, 0800,003C,0180,0A78,0000,1335 :2910
U 1335, 0018,0038,1980,0AF8,0000,1336 :2911
U 1336, 0001,003C,0180,09C0,0000,1337 :2912
U 1337, 0000,003C,0180,0A70,0000,1338 :2913
U 1338, 001C,2000,0180,0800,0010,1339 :2914
U 1339, 0000,013C,0180,0800,0000,11B4 :2915
U 11B4, 0000,003C,0180,0800,0000,133A :2916
U 11B5, 0000,003D,0180,0800,0000,120A :2917
U 133A, 0000,003C,5D80,0800,0084,733B :2918
U 1338, 0001,0024,0180,0800,0010,133C :2919
U 133C, 0000,013C,0180,0800,0000,11B6 :2920
U 11B6, 0000,003D,0180,0800,0000,120A :2921
:2922
U 11B7, 0000,003C,0180,0800,0000,133D :2923
U 133D, 0800,003C,4DF0,2E28,0000,133E :2924
U 133E, 0019,2024,49C0,0800,0000,133F :2925
U 133F, 081C,2030,0180,0A30,0000,1340 :2926
U 1340, 0001,003C,0180,09E0,0000,1341 :2927
U 1341, 0001,203C,0180,09D8,0000,1342 :2928
U 1342, 001D,2000,0180,0800,0010,1343 :2929
U 1343, 0000,013C,0180,0800,0000,11B8 :2930
U 11B8, 0000,003D,0180,0800,0000,120A :2931
U 11B9, 0000,003C,4D80,3C00,0000,1344 :2932
U 1344, 0000,003C,4DF0,2C00,0000,1345 :2933
U 1345, 0019,2024,49C0,0800,0000,1346 :2934
U 1346, 0003,003C,0180,09E0,0000,1347 :2935
U 1347, 0001,203C,0180,09D8,0000,1348 :2936
U 1348, 0001,203C,0180,0800,0010,1349 :2937
U 1349, 0000,013C,0180,0800,0000,11BA :2938
U 11BA, 0000,003D,0180,0800,0000,120A :2939
U 11BB, 0F00,003C,0180,0800,0000,134A :2940
U 134A, 0000,003C,4980,3C00,0000,134B :2941
U 134B, 0000,003C,49F0,2C00,0000,134C :2942
U 134C, 0019,2034,8DC0,0800,0000,134D :2943
U 134D, 0003,003C,0180,09D0,0000,134E :2944
U 134E, 0001,203C,0180,09C8,0000,134F :2945
U 134F, 0001,203C,0180,0800,0010,1350 :2946
U 1350, 0000,013C,0180,0800,0000,11BC :2947
U 11BC, 0000,003D,0180,0800,0000,120A :2948
U 11BD, 0000,003C,0180,0A20,0000,1351 :2949
U 1351, 0018,0014,0980,0AA0,0000,1352 :2950
U 1352, 0000,003C,0180,0A30,0000,1353 :2951
U 1353, 0020,003C,0180,0AB0,0000,1354 :2952
U 1354, 0000,003C,0180,0A18,0000,1355 :2953
U 1355, 0018,0000,0580,0A98,0010,1356 :2954

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:2900
:2901 Q ID[TBER0] ; FORCE A PARITY ERROR.
:2902 ALU Q[AND]K[.1F],Q_ALU ; SEE IF BITS GOT SET.
:2903 RC[0A]_D
:2904 RC[9]_D
:2905 ALU_Q=D,CLK.UBCC
:2906 Z?
:2907 ERROR1 ; CAN'T SET BITS<4:0> (OR READ REG.) IN TBER0.
=0 LAB R[0E]
:2908 R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF TB PARITY ERRO
:2909 D R[0F]
:2910 ALU Q(K),R[0F]_ALU ; CHECK THE UTRAP FLAG
:2911 RC[8]_D ; TO SEE IF A UTRAP OCCURRED
:2912 LAB R[0E] ; SEE IF A TRAP OCCURRED.
:2913 ALU_LA[A-B]D,CLK.UBCC
:2914 Z?
:2915 J/TBPARS ; OK TRAPPED.
=0 ERROR1 ; NO TRAP OCCURRED!
TBPARS: SC K[.7] ; SEE IF THE TRAP WAS A TB PARITY ERROR.
:2918 ALU_D.ANDNOT.MASK,CLK.UBCC
:2919 Z?
:2920 ERROR1 ; A TRAP WHICH WAS NOT A TB PARITY ERROR
=0 ; TRAP OCCURRED.
:2921 NOP ; OK
:2922 Q ID[TBER1],D R[5] ; SEE IF TBER1<31:8> IS SET CORRECTLY.
:2923 ALU Q[ANDNOT]R[.FF],Q_ALU ; MASK OFF IPA ERROR BITS
:2924 LAB R[6],ALU_LA[OR]D,D_ALU
:2925 RC[0C]_D
:2926 RC[0B]_Q
:2927 ALU_Q=D,CLK.UBCC
:2928 Z?
:2929 ERROR1 ; TBER1<31:8> NOT SET CORRECTLY.
=0 ID[TBER1]_D ; SHOULD CLEAR TBER1<31:8>
:2931 Q ID[TBER1] ; SEE IF TBER1 WAS CLEARED.
:2932 ALU Q[ANDNOT]K[.FF],Q_ALU
:2933 RC[0C]_D
:2934 RC[0B]_Q
:2935 ALU_Q,CLK.UBCC
:2936 Z?
:2937 ERROR1 ; REFERENCE TO TBER1 DIDN'T CLEAR BITS<31:8>
=0 D 0
:2938 ID[TBER0]_D ; SEE IF TBER0<4:0> CAN BE CLEARED.
:2939 Q ID[TBER0]
:2940 ALU Q[AND]K[.1F],Q_ALU
:2941 RC[0A]_D
:2942 RC[9]_D
:2943 ALU_Q,CLK.UBCC
:2944 Z?
:2945 ERROR1 ; CAN'T WRITE AND READ 0'S IN TBER0<4:0>.
=0 LAB R[4] ; HAVE ALL THE TB DATA PARITY CHECKERS
:2947 R[4] LA+K[.2] ; BEEN TESTED?
:2948 LAB R[6] ; IF NOT THEN INCREMENT THE
:2949 ALU_LA,SHF/LEFT,S1/ZERO,R[6] SHF ; PATTERN USED IN THE MAINTENANCE
:2950 LAB R[3] ; REGISTER AND CONTINUE
:2951 R[3]_LA-K[.1],CLK.UBCC

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:2992
:2993
:2994
:2995
:2996
:2997
:2998
:2999
:3000
:3001
:3002
:3003
:3004
:3005
:3006
:3007
:3008
:3009
U 11C0. 0000.003D.0180.0800.0000.11F2
U 11C1. 0018.0038.D580.09F8.0000.11C2
U 11C2. 0000.003D.0180.0800.0000.1213
U 11C3. 0000.003C.0180.0800.0000.11C4
U 11C4. 0000.003D.0180.0800.0000.1269
U 11C5. 0F00.003C.0180.0800.0000.11C6
U 11C6. 0000.003D.0180.0800.0000.105C
U 11C7. 0001.003C.0180.0AF0.0000.135C
:3010
:3011
:3012
:3013
:3014
:3015
:3016
:3017
:3018
:3019
:3020
:3021
:3022
U 135C. 0010.0038.0180.0908.0200.135D
U 135D. 0000.003C.0180.0900.0000.11C8
U 11C8. 0010.0039.0180.0AC0.0000.10F0
U 11C9. 0010.0038.0180.0920.0200.135E
U 135E. 0010.0038.0180.09D0.0000.135F
U 135F. 0810.0038.0180.0918.0000.1360
U 1360. 0000.003C.E580.0800.0084.71CA
U 11CA. 0001.0035.0180.0AC0.0000.10EE
U 11CB. 0000.003C.0180.0800.0000.11CC
U 11CC. 0000.003D.0180.0800.0000.1209
U 11CD. 0000.003C.0180.0A70.0000.1361
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.PAGE "TEST AA MODIFY BIT UTRAP TEST"
*****
++
TEST AA MODIFY BIT UTRAP TEST

TEST DESCRIPTION
THIS IS A TEST OF THE MODIFY BIT TRAPS IN BOTH GROUPS. A
REFERENCE IS MADE TO A TB HIT ADDRESS CONTAINING A PTE
WITH THE M BIT CLEAR. THIS SHOULD RESULT IN A UTRAP.

ERROR DESCRIPTION
EXPECTED TBERO (IF CHECKING HIT/MISS BITS)
OR GOT TBERI (IF UNEXPECTED UTRAP OCCURRED)
ACTUAL TBERO
EXPECTED TIME OUT ADDRESS REGISTER
ACTUAL TIME OUT ADDRESS REGISTER
VA WRITTEN
UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)

FLAG UTRAP TYPE
----
DE NO UTRAP OCCURRED
5E TB PARITY ERROR
9E TB MISS
CE TB PROTECTION ERROR
D6 TB MODIFY BIT ERROR
DA X PAGE UTRAP
DC UNALIGNED DATA UTRAP

-----
=0
TBM: NEWST
RC[0F] K[.6]
=0 CALL,J7CSOFF ; TURN OFF THE CACHE AND SBI CYCLES
NOP
=0 CALL,J/TBWPTP ; GENERATE SOME TEST DATA PATTERNS
D 0
=0 CALL,J/DC.DE
RC[0E] D ; SET UP THE UTRAP FLAG, RC[0E]=DE
////////////////////////////////////
+
SUBTEST 1
FIRST PERFORM TEST IN GROUP 0.
-
VA RC[1] ; VA=4CCCC000
LC RC[0] ; RC[0]=PTE=A4155555
=0 R[8] LC CALL,J/TBWRB ; WRITE VA=4CCCC000 INTO BOTH GROUPS
VA RC[4] ; VA=55554000
RC[0A] LC
D RC[3] ; PTE=A0199999
SC K[.1A] ; WRITE THIS PTE AT VA=55554000 INTO GROUP 0
=0 ALD D.AND.MASK,R[8]_ALU,CALL,J/TBWRO ; WRITE PTE WITH M BIT=0.
NOP
=0 ERLOOP
LAB RC[0E] ; SET UP UTRAP FLAG

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U 1361, 0000,003C,0180,52F8,0000,1362 :3034
U 1362, 0800,003C,0180,0A78,0000,1363 :3035
U 1363, 0018,0038,1980,0AF8,0000,1364 :3036
U 1364, 0001,003C,0180,09C8,0000,1365 :3037
U 1365, 0000,003C,0180,0A70,0000,1366 :3038
U 1366, 001C,2000,0180,0800,0010,1367 :3039
U 1367, 0000,013C,0180,0800,0000,11CE :3040
U 11CE, 0000,003C,0180,0800,0000,1368 :3041
U 11CF, 0000,003D,0180,0800,0000,120A :3042
U 1368, 0000,003C,0D80,0800,0084,7369 :3043
U 1369, 0001,0024,0180,0800,0010,136A :3044
U 136A, 0000,013C,0180,0800,0000,11D0 :3045
U 11D0, 0000,003D,0180,0800,0000,120A :3046
U 11D1, 0000,003C,0180,1000,0000,136B :3047
U 136B, 0000,1D3C,0180,0800,0000,101C :3048
U 101C, 0000,003D,0180,0800,0000,120A :3049
U 101D, 0000,003C,0180,0800,0000,136C :3050
U 101E, 0000,003D,0180,0800,0000,120A :3051
U 101F, 0000,003D,0180,0800,0000,120A :3052
U 136C, 0000,003C,0180,0800,0000,136D :3053
:3054
U 136D, 0010,0038,0180,0908,0200,136E :3055
U 136E, 0010,0038,0180,09D0,0000,136F :3056
U 136F, 0000,003C,0180,0910,0000,10C8 :3057
U 10C8, 0010,0039,0180,0AB8,0000,124C :3058
U 10C9, 0000,003D,0180,0800,0000,120A :3059
U 10CA, 0000,003D,0180,0800,0000,120A :3060
U 10CB, 0000,003D,0180,0800,0000,120A :3061
U 10CC, 0000,003D,0180,0800,0000,1223 :3062
U 10CD, 0000,003D,0180,0800,0000,120A :3063
U 10CE, 0000,003D,0180,0800,0000,120A :3064
U 10CF, 0000,003C,0180,1000,0000,1370 :3065
U 1370, 0000,1D3C,0180,0800,0000,103C :3066
U 103C, 0000,003C,0180,0800,0000,1371 :3067
U 103D, 0000,003D,0180,0800,0000,120A :3068
U 103E, 0000,003D,0180,0800,0000,120A :3069
U 103F, 0000,003D,0180,0800,0000,120A :3070
U 1371, 0000,003C,0180,0800,0000,11D2 :3071
:3072
:3073
:3074
:3075
:3076
U 11D2, 0000,003D,0180,0800,0000,120E :3077
U 11D3, 0000,003C,0180,0800,0000,11D4 :3078
U 11D4, 0000,003D,0180,0800,0000,1209 :3079
U 11D5, 0010,0038,0180,0938,0200,1372 :3080
U 1372, 0010,0038,0180,09D0,0000,1373 :3081
U 1373, 0000,003C,0180,0930,0000,11D6 :3082
U 11D6, 0010,0039,0180,0AC0,0000,10F0 :3083
U 11D7, 0000,003C,0180,0A08,0200,1374 :3084
U 1374, 0800,003C,0180,0A00,0000,1375 :3085
U 1375, 0000,003C,E580,0800,0084,71D8 :3086
U 11D8, 0001,0035,0180,0AC0,0000,10E8 :3087
U 11D9, 0000,003C,0180,0A70,0000,1376 :3088

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R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF M BIT.
D R[0F] ; SEE IF TRAP OCCURRED
A[U 0(K),R[0F]]_ALU
RC[9] D
LAB R[0E]
ALU_L[A-B]D,CLK.UBCC ; SEE IF A UTRAP OCCURRED.
Z?
=0 J/TBMB1
ERROR1 ; DIDN'T TRAP WITH M BIT CLEAR
TBMB1: SC KC.3] ; SEE IF THE TRAP WAS AN M BIT TRAP.
ALD_D.ANDNOT.MASK,CLK.UBCC
Z?
=0 ERROR1 ; THE TRAP WAS NOT AN M BIT TRAP.
FS/MCT,MCT/TEST.WCHK ; CHECK BRANCH TB.TEST
BEN/TB.TEST
=11100 ERROR1 ; BEN/TB.TEST FAILED AFTER AN M BIT ERROR
J/TBMB15
ERROR1
ERROR1
TBMB15: NOP
; MAKE SURE GROUP 1 IS INTACT.
VA RC[1] ; VA=4CCCC000
RC[0A] LC
LC RC[2]
=000 RC[7] LC,CALL,J/HIT1 ; CHECK FOR A HIT IN GROUP 1
ERROR1 ; A NON TB MISS UTRAP OCCURRED
ERROR1 ; A TB MISS UTRAP OCCURRED
ERROR1 ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
ERROR1 ; A UTRAP OCCURRED
ERROR1 ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
FS/MCT,MCT/TEST.WCHK ; CHECK THE BRANCH TB.TEST WITH NO ERRORS
BEN/TB.TEST
=11100 J/TBMB16
ERROR1 ; BRANCH TB.TEST FAILED WITH NO ERRORS
ERROR1
ERROR1
TBMB16: NOP
:////////////////////
:
SUBTEST 2
NOW TEST GROUP 1.
=0 SUBTEST
NOP
=0 ERLOOP
VA RC[7] ; VA=33330000
RC[0A] LC
LC RC[8] ; RC[6]=PTE=A40AAAAA
R[8] LC,CALL,J/TBWRB ; WRITE VA=33330000 INTO BOTH GROUPS
VA RC[1] ; VA=2AAA8000
D R[0] ; PTE=A0066666
SC KC.1A] ; WRITE THIS INTO GROUP 0
ALD_D.AND.MASK,R[8]_ALU,CALL,J/TBWR1 ; WRITE PTE WITH M BIT=0.
LAB R[0E] ; SET UTRAP FLAG

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U 1376.	0000,003C,0180,52F8,0000,1377	:3089
U 1377.	0800,003C,0180,0AF8,0000,1378	:3090
U 1378.	0018,0038,1980,0AF8,0000,1379	:3091
U 1379.	0001,003C,0180,09C8,0000,137A	:3092
U 137A.	0000,003C,0180,0A70,0000,137B	:3093
U 137B.	001C,2000,0180,0800,0010,137C	:3094
U 137C.	0000,013C,0180,0800,0000,11DA	:3095
U 11DA.	0000,003C,0180,0800,0000,137D	:3096
U 11DB.	0000,003D,0180,0800,0000,120A	:3097
U 137D.	0000,003C,0D80,0800,0084,737E	:3098
U 137E.	0001,0024,0180,0800,0010,137F	:3099
U 137F.	0000,013C,0180,0800,0000,11DC	:3100
U 11DC.	0000,003D,0180,0800,0000,120A	:3101
U 11DD.	0000,003C,0180,1000,0000,1380	:3102
U 1380.	0000,1D3C,0180,0800,0000,107C	:3103
U 107C.	0000,003D,0180,0800,0000,120A	:3104
U 107D.	0000,003C,0180,0800,0000,1381	:3105
U 107E.	0000,003D,0180,0800,0000,120A	:3106
U 107F.	0000,003D,0180,0800,0000,120A	:3107
U 1381.	0000,003C,0180,0800,0000,1382	:3108
		:3109
U 1382.	0010,0038,0180,0938,0200,1383	:3110
U 1383.	0010,0038,0180,09D0,0000,1384	:3111
U 1384.	0000,003C,0180,0940,0000,10D0	:3112
U 10D0.	0010,0039,0180,0AB8,0000,123F	:3113
U 10D1.	0000,003D,0180,0800,0000,120A	:3114
U 10D2.	0000,003D,0180,0800,0000,120A	:3115
U 10D3.	0000,003D,0180,0800,0000,120A	:3116
U 10D4.	0000,003D,0180,0800,0000,1223	:3117
U 10D5.	0000,003D,0180,0800,0000,120A	:3118
U 10D6.	0000,003D,0180,0800,0000,120A	:3119
U 10D7.	0000,003C,0180,1000,0000,1385	:3120
U 1385.	0000,1D3C,0180,0800,0000,109C	:3121
U 109C.	0000,003C,0180,0800,0000,1386	:3122
U 109D.	0000,003D,0180,0800,0000,120A	:3123
U 109E.	0000,003D,0180,0800,0000,120A	:3124
U 109F.	0000,003D,0180,0800,0000,120A	:3125
U 1386.	0000,003C,0180,0800,0000,11DE	:3126

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R[OF] LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF M BIT.
D R[OF] ; SEE IF A UTRAP OCCURRED
ALU O(K),R[OF],ALU
RC[9] D
LAB R[OE]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A UTRAP OCCURRED.
Z?
=0 J/TBMB2
ERROR1 ; DIDN'T TRAP.
TBMB2: SC K[.3] ; SEE IF THE TRAP WAS AN M BIT TRAP.
ALU_D.ANDNOT.MASK,CLK.UBCC
Z?
=0 ERROR1 ; THE TRAP WAS NOT AN M BIT TRAP.
FS/MCT,MCT/TEST.WCHK ; CHECK BRANCH TB.TEST AFTER AN MBIT
BEN/TB.TEST ; ERROR.
=11100 ERROR1 ; BRANCH TB.TEST FAILED AFTER AN MBIT ERROR
J/TBMB25
ERROR1
ERROR1
TBMB25: NOP
; MAKE SURE GROUP 0 IS INTACT.
VA RC[7] ; VA=33330000
RC[0A] LC
LC RC[8]
=000 RC[7] LC,CALL,J/HITO ; CHECK FOR HIT IN GROUP 0
ERROR1 ; A NON TB MISS UTRAP OCCURRED
ERROR1 ; A TB MISS UTRAP OCCURRED
ERROR1 ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
CALL,J/RELCHK ; CHECK THE RELOCATED ADDRESS
ERROR1 ; A UTRAP OCCURRED
ERROR1 ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
FS/MCT,MCT/TEST.WCHK ; CHECK BRANCH TB.TEST AFTER
BEN/TB.TEST ; A REFERENCE WITH NO ERROR
=11100 J/TBMB26
ERROR1 ; BRANCH TB.TEST FAILED AFTER A
ERROR1 ; REFERENCE WITH NO ERROR.
ERROR1
TBMB26: NOP

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:3127 .PAGE 'TEST AB TB VALID BIT UTRAP TEST'
:3128 *****
:3129 ++
:3130 TEST AB TB VALID BIT UTRAP TEST
:3131
:3132 TEST DESCRIPTION
:3133 THIS IS A TEST OF THE VALID BIT INPUTS TO THE TB MEMORIES
:3134 AND THE OUTPUT OF EACH GROUP'S VALID BIT TO THE TB HIT
:3135 COMPARATORS. A PTE IS MADE A HIT IN EACH GROUP WHICH
:3136 HAS THE VALID BIT DEASSERTED. THESE PTE'S SHOULD RESULT IN
:3137 TB MISS TRAPS WHEN A REFERNECE IS MADE WHICH INDEXES TO
:3138 THEM.
:3139
:3140 ERROR DESCRIPTION
:3141 EXPECTED TBERO
:3142 ACTUAL TBERO (HIT/MISS BITS RELEVANT)
:3143 EXPECTED TIME OUT ADDRESS REGISTER
:3144 GOT TIME OUT ADDRESS REGISTER
:3145 VA WRITTEN
:3146 UTRAP FLAG
:3147 FLAG UTRAP TYPE
:3148 -----
:3149 DE NO UTRAP OCCURRED
:3150 SE TB PARITY ERROR
:3151 9E TB MISS
:3152 CE TB PROTECTION ERROR
:3153 D6 TB MODIFY BIT ERROR
:3154 DA X PAGE UTRAP
:3155 DC UNALIGNED DATA UTRAP
:3156
:3157 --
:3158 *****
:3159 =0
:3160 TBVAL: NEWTST
:3161 RC[0F],K[.6]
:3162 =0 CALL,J7CSOFF ; TURN OFF THE CACHE AND SBI CYCLES
:3163 D 0
:3164 =0 CALL,J/DC.DE
:3165 RC[0E],D ; SET UP THE UTRAP FLAG, RC[0E]=DE
:3166 =0 CALL,J/TBWPTP ; GENERATE SOME TEST DATA PATTERNS
:3167 SC,K[.1F] ; WRITE VA=4CCCC000
:3168 D,RC[0] ; WITH PTE=24155555
:3169 A[U D.AND.MASK,R[8] ALU ; INTO GROUP 0
:3170 =0 VA,RC[1],CALL,J/TBWRB
:3171 D,RC[3] ; WRITE VA=55554000
:3172 A[U D.AND.MASK,R[8] ALU ; WITH PTE=24199999
:3173 =0 VA,RC[4],CALL,J/TBWR1 ; INTO GROUP 1
:3174 VA,RC[1] ; VA=4CCCC000
:3175 =00 RC[0A],LC,CALL,J/MISS ; CHECK FOR MISS AT VA=4CCCC000
:3176 ERROR1 ; NO UTRAP OCCURRED (EXPECTED TB MISS)
:3177 ERROR1 ; UTRAPPED BUT NOT BECAUSE OF TB MISS
:3178 VA,RC[4] ; VA=55554000
:3179 =
:3180 =00 RC[0A],LC,CALL,J/MISS ; CHECK FOR MISS AT VA=55554000
:3181 ERROR1 ; NO UTRAP OCCURRED (EXPECTED TB MISS)

```

```

U 11DE, 0000,003D,0180,0800,0000,11F2
U 11DF, 0018,0038,D580,09F8,0000,11E0
U 11E0, 0000,003D,0180,0800,0000,1213
U 11E1, 0F00,003C,0180,0800,0000,11E2
U 11E2, 0000,003D,0180,0800,0000,105C
U 11E3, 0001,003C,0180,0AF0,0000,11E4
U 11E4, 0000,003D,0180,0800,0000,1269
U 11E5, 0000,003C,8D80,0800,0084,7387
U 1387, 0810,0038,0180,0900,0000,1388
U 1388, 0001,0034,0180,0AC0,0000,11E6
U 11E6, 0010,0039,0180,0908,0200,10F0
U 11E7, 0810,0038,0180,0918,0000,1389
U 1389, 0001,0034,0180,0AC0,0000,11E8
U 11E8, 0010,0039,0180,0920,0200,10E8
U 11E9, 0010,0038,0180,0908,0200,10E0
U 10E0, 0010,0039,0180,09D0,0000,1234
U 10E1, 0000,003D,0180,0800,0000,120A
U 10E2, 0000,003D,0180,0800,0000,120A
U 10E3, 0010,0038,0180,0920,0200,10E4
U 10E4, 0010,0039,0180,09D0,0000,1234
U 10E5, 0000,003D,0180,0800,0000,120A

```


H 2

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SEQ 0428
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U 10E6.	0000,003D,0180,0800,0000,120A	:3182	ERROR1
U 10E7.	0000,003C,0180,0800,0000,138A	:3183	NOP
		:3184	
U 138A.	0000,003C,0180,0800,0000,11EA	:3185	NOP
		:3186	
U 11EA.	0000,003D,0180,0800,0000,11F2	:3187	DUMMY1: NEWTST

; UTRAPPED BUT NOT BECAUSE OF TB MISS

[illegible]

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	2456=	2457=	2458=	2459=
U 1008	2285=	2286=	2287=	2288=	2289=	2290=	2291=	2292=
U 1010	2301=	2302=	2303=	2304=	2305=	2306=	2307=	2308=
U 1018	2483=	2484=	2485=	2486=	3049=	3050=	3051=	3052=
U 1020	2313=	2314=	2315=	2316=	2317=	2318=	2319=	2320=
U 1028	2337=	2338=	2339=	2340=	2341=	2342=	2343=	2344=
U 1030	2354=	2355=	2356=	2357=	2358=	2359=	2360=	2361=
U 1038	2514=	2515=	2516=	2517=	3067=	3068=	3069=	3070=
U 1040	2366=	2367=	2368=	2369=	2370=	2371=	2372=	2373=
U 1048	2539=	2540=	2541=	2542=	1862=	1863=	1902:	1839
U 1050	2443=	2444=	2445=	2446=	2447=	2448=	2449=	2450=
U 1058	1951=	1952=	1905:	1840	1970=	1971=	1908:	1841
U 1060	2472=	2473=	2474=	2475=	2476=	2479=	2480=	2481=
U 1068	2502=	2503=	2504=	2505=	2506=	2507=	2508=	2509=
U 1070	2530=	2531=	2532=	2533=	2534=	2535=	2536=	2537=
U 1078	2637=	2638=	2639=	2640=	3104=	3105=	3106=	3107=
U 1080	2548=	2549=	2550=	2551=	2552=	2553=	2554=	2555=
U 1088	2624=	2625=	2626=	2627=	2628=	2629=	2630=	2631=
U 1090	2653=	2654=	2655=	2656=	2657=	2658=	2659=	2660=
U 1098	2662=	2663=	2664=	2665=	3122=	3123=	3124=	3125=
U 10A0	2679=	2680=	2681=	2682=	2683=	2684=	2685=	2686=
U 10A8	2705=	2706=	2707=	2708=	2709=	2710=	2711=	2712=
U 10B0	2723=	2724=	2725=	2726=	2727=	2728=	2729=	2730=
U 10B8	2965=	2966=	2967=	2968=	2969=	2970=	2971=	2972=
U 10C0	2973=	2974=	2975=	2976=	2977=	1842	1972=	1973=
U 10C8	3058=	3059=	3060=	3061=	3062=	3063=	3064=	3065=
U 10D0	3113=	3114=	3115=	3116=	3117=	3118=	3119=	3120=
U 10D8	2691=	2692=	2693=	2694=	2714=	2715=	2716=	2717=
U 10E0	3175=	3176=	3177=	3178=	3180=	3181=	3182=	3183=
U 10E8	1982=	1983=	1984=	1985=	1986=	1987=	1992=	1993=
U 10F0	1996=	1997=	2006=	2007=	2008=	2009=	2025=	2026=
U 10F8	2027=	2028=	2037=	2038=	2053=	2054=	2058=	2059=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1843	2075=	2076=	1834:	1835:	1836:	1837:
U 1110	2078=	2079=	2083=	2084=	2111=	2112=	2114=	2115=
U 1118	2117=	2118=	2121=	2122=	2124=	2125=	2127=	2128=
U 1120	2131=	2132=	2135=	2136=	2175=	2176=	2180=	2181=
U 1128	2183=	2184=	2185=	2186=	2190=	2191=	2193=	2194=
U 1130	2195=	2196=	2200=	2201=	2203=	2204=	2205=	2206=
U 1138	2210=	2211=	2213=	2214=	2259=	2260=	2261=	2262=
U 1140	2263=	2264=	2265=	2266=	2271=	2272=	2274=	2275=
U 1148	2282=	2284=	2299=					

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2834=	2836=	2844=	2845=	2852=	2853=	2861=	2862=
U 11A8	2869=	2870=	2876=	2877=	2879=	2880=	2887=	2888=
U 11B0	2896=	2897=	2907=	2908=	2916=	2917=	2921=	2923=
U 11B8	2931=	2932=	2939=	2940=	2948=	2949=	2956=	2957=
U 11C0	3010=	3011=	3012=	3013=	3014=	3015=	3016=	3017=
U 11C8	3025=	3026=	3030=	3031=	3032=	3033=	3041=	3042=
U 11D0	3046=	3047=	3077=	3078=	3079=	3080=	3083=	3084=
U 11D8	3087=	3088=	3096=	3097=	3101=	3102=	3160=	3161=
U 11E0	3162=	3163=	3164=	3165=	3166=	3167=	3170=	3171=
U 11E8	3173=	3174=	3187=	1864	1865	1866	1867	1868
U 11F0	1869	1870	1880	1881	1882	1883	1884	1885
U 11F8	1886	1887	1888	1889	2223:	2224:	2225:	2226:
U 1200	1890	1891	1892	1893	1894	1895	1896	1897
U 1208	1898	1899	1900	1901	1903	1904	1936	1937
U 1210	1943	1944	1945	1950	1953	1954	1957	1958
U 1218	1959	1960	1963	1964	1965	1988	1989	1999
U 1220	2010	2011	2012	2018	2019	2020	2021	2022
U 1228	2023	2024	2029	2030	2031	2032	2033	2034
U 1230	2035	2036	2039	2040	2045	2046	2047	2048
U 1238	2049	2050	2051	2052	2055	2056	2057	2066
U 1240	2067	2068	2069	2070	2071	2072	2073	2074
U 1248	2077	2080	2081	2082	2086	2088	2089	2090
U 1250	2091	2092	2093	2094	2095	2096	2097	2098
U 1258	2099	2100	2101	2102	2103	2104	2105	2106
U 1260	2107	2108	2109	2113	2119	2123	2129	2133
U 1268	2137	2163	2164	2165	2166	2167	2168	2169
U 1270	2170	2171	2172	2173	2174	2177	2178	2179
U 1278	2182	2187	2188	2189	2192	2197	2198	2199
U 1280	2202	2207	2208	2209	2212	2218	2267	2273
U 1288	2276	2277	2278	2279	2280	2281	2293	2294
U 1290	2295	2296	2297	2298	2310	2311	2312	2326
U 1298	2329	2330	2331	2332	2333	2345	2346	2347
U 12A0	2348	2349	2350	2363	2364	2365	2374	2375
U 12A8	2423	2435	1929:	2438	2451	2452	2453	2454
U 12B0	2455	2467	2468	2469	2482	2495	2496	2497
U 12B8	2510	2511	2512	2513	2525	2538	2545	2546
U 12C0	2547	2556	2557	2605	2616	2619	2632	2633
U 12C8	2634	2635	2636	2648	2649	2650	2661	2674
U 12D0	2675	2676	2687	2688	2689	2690	2702	2713
U 12D8	2720	2721	2722	2731	2732	2775	2776	2779
U 12E0	2780	2781	2782	2783	2794	2795	2796	2797
U 12E8	2798	2799	2802	2803	2804	2805	2806	2807
U 12F0	2808	2811	2812	2814	2815	2816	2817	2818
U 12F8	2819	2822	2823	2824	2825	2826	2827	2828
U 1300	2831	2832	2833	2837	2838	2839	2840	2841
U 1308	2842	2843	2846	2847	2848	2849	2850	2851
U 1310	2854	2855	2856	2857	2858	2859	2860	2863
U 1318	2864	2865	2866	2867	2868	2878	2881	2882
U 1320	2883	2884	2885	2886	2889	2890	2891	2892
U 1328	2893	2894	2895	2898	2899	2901	2902	2903
U 1330	2904	2905	2906	2909	2910	2911	2912	2913
U 1338	2914	2915	2918	2919	2920	2924	2925	2926
U 1340	2927	2928	2929	2930	2933	2934	2935	2936

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ESKAH28.MCR MICRO2 1M(01) 16-DEC-82 11:08:06

K 2

SEQ 0431
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;Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2937	2938	2941	2942	2943	2944	2945	2946
U 1350	2947	2950	2951	2952	2953	2954	2955	2960
U 1358	2961	2962	2963	2964	3023	3024	3027	3028
U 1360	3029	3034	3035	3036	3037	3038	3039	3040
U 1368	3043	3044	3045	3048	3053	3055	3056	3057
U 1370	3066	3071	3081	3082	3085	3086	3089	3090
U 1378	3091	3092	3093	3094	3095	3098	3099	3100
U 1380	3103	3108	3110	3111	3112	3121	3126	3168
U 1388	3169	3172	3185					
U 1390 - 13EF Unused								
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

00000000
00

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L 2

SEQ 0432
Page 8

ZZ
ES

ESKODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH2B	923

Used	923
Remaining	

```
Total microwords used in memory U: 923
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

[illegible]

ZZ-ESKAH-V132 Line Number Index
ESKAH28.MCR

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M 2

SEQ 0433
Page 8

; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH28.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

```

: 3      Control ROM Field Definitions
: 548    Register Transfer Macro Definitions
: 1413   Non-transfer Functions
: 1485   Branch Enable Macro Definitions
: 1564   MICRO DIAGNOSTIC DEFINED MACROS
: 1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2227   TEST AC ALIGN UTRAP LOGIC TEST
: 2451   TEST AD CROSS PAGE UTRAP USING DT/LONG TEST
: 2545   TEST AE CROSS PAGE UTRAP USING DT/WORD TEST
: 2633   TEST AF CROSS PAGE UTRAP ENABLE TEST
: 2688   TEST B0 TB PROTECTION LOGIC TEST
: 3062   TEST B1 IPA REGISTER TEST
: 3124   TEST B2 READ.V.NEWPC, HIT IN GROUP 0, TEST

```

ZZ-ESKAH-V132 Subroutines
ESKAH29.MCR

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B 3

SEQ 0435
Page

:1
:1804 .NOLIST
:1805 .LIST

ZZ-
ESI
C
C
C
C


```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      +
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN.
:1819
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823
:1824      -
U 1100, 0000,003C,1980,0800,0084,7003 :1825      1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001 :1826      1101: SC_K[.1],J/TRPHO      : DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001 :1827      1102: SC_K[.2],J/TRPHO      : X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001 :1828      1103: SC_K[.3],J/TRPHO      : TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001 :1829      1104: SC_K[.4],J/TRPHO      : TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001 :1830      1105: SC_K[.6],J/TRPHO      : TB MISS
U 1106, 0000,003C,D980,0800,0084,7001 :1831      1106: SC_K[.9],J/TRPHO      : RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001 :1832      1107: SC_K[.7],J/TRPHO      : TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001 :1833      1108: SC_K[.8],J/TRPHO      : CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003 :1834      110C: SC_K[.C],J/TRPH1      : RDS
U 110D, 0000,003C,8980,0800,0084,7003 :1835      110D: SC_K[.D],J/TRPH1      : TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001 :1836      110E: SC_K[.10],J/TRPHO      : ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003 :1837      110F: SC_K[.F],J/TRPH1      : CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1016 :1838      TRPH0: Q_ID[USTACK]
U 1016, 0C00,003C,01E0,0800,0000,101E :1839      : Q-D,D,Q
U 101E, 0000,003C,8180,3C00,0000,1036 :1840      : ID[USTACK],D
U 1036, 0C00,003C,01E0,0800,0000,103E :1841      : Q-D,D,Q
U 103E, 0000,003C,01C0,0A78,0000,104F :1842      : Q-R[OF]
U 104F, 0001,2024,0180,0800,0010,105B :1843      : ALU_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
U 105B, 0000,013C,0180,0800,0000,1002 :1844      : Z?      : BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000 :1845      : =0      : ALU_Q.AND.MASK,R[OF],ALU,RETURN ; CLEAR THE BIT AND RETURN
:1846      +
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      -

```

U 1003, 0018,0038,1D80,09E8,0000,1014 :1861
U 1014, 0000,003D,D980,0800,0084,71E6 :1862
U 1015, 0000,003C,49F0,2C00,0000,105F :1863
U 105F, 0001,203C,4DF0,2DB0,0000,1109 :1864
U 1109, 0001,203C,65F0,2DB8,0000,1154 :1865
U 1154, 0001,203C,6DF0,2DD8,0000,11C8 :1866
U 11C8, 0001,203C,75F0,2DE0,0000,11C9 :1867
U 11C9, 0001,203C,79F0,2DC8,0000,11CA :1868
U 11CA, 0001,203C,69F0,2DC0,0000,11CB :1869
U 11CB, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,11E0 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 11CC, 0000,003C,65F8,0800,0084,71CD :1880
U 11CD, 0818,0038,8D80,0800,0000,11CE :1881
U 11CE, 0D00,003C,0180,0800,0000,11CF :1882
U 11CF, 0000,003C,3D80,3C00,0000,11D0 :1883
U 11D0, 0818,0038,0580,0800,0000,11D1 :1884
U 11D1, 0D00,003C,0180,0800,0000,11D2 :1885
U 11D2, 0F00,003C,3180,3C00,0000,11D3 :1886
U 11D3, 0000,003C,5D80,3C00,0000,11D4 :1887
U 11D4, 0000,003C,3980,3C00,0000,11D5 :1888
U 11D5, 0000,003C,2980,3C00,0000,11D6 :1889
U 11D6, 0000,003C,4980,3C00,0000,11D7 :1890
U 11D7, 0818,0038,C180,0800,0000,11D8 :1891
U 11D8, 0000,003C,6580,3C00,0000,11D9 :1892
U 11D9, 0F00,003C,5D80,3C00,0000,11DA :1893
U 11DA, 0000,003C,6D80,3C00,0000,11DB :1894
U 11DB, 0000,003C,6580,3C00,0000,11DC :1895
U 11DC, 0003,003C,0180,09F0,0000,11DD :1896
U 11DD, 0003,003C,0180,0AF8,0000,11DE :1897
U 11DE, 0003,003C,0180,09E8,0000,105E :1898
U 11DF, 0818,0038,0980,0800,0000,105E :1899
U 11E0, 0810,0038,0180,0978,0000,11E1 :1900
U 11E1, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 11E2, 0810,0038,0180,0978,0000,11E3 :1903
U 11E3, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905
:1906
:1907
U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6]_Q_Q_ID[TBER1]
RC[7]_Q_Q_ID[SBI.ERR]
RC[0B]_Q_Q_ID[FAULT]
RC[0C]_Q_Q_ID[MAINT]
RC[9]_Q_Q_ID[PARITY]
RC[8]_Q_Q_ID[TIME.ADDR]
RC[0A]_Q_Q_ID[USTACK]
1000: RC[0E]_Q_ERROR1

:+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWST
ERLOOP
ERROR1
ERROR2

SCOPE: SC_K[.10],Q_0

: SETUP TO WRITE IPL OF 1F
: ...
: WRITE THE PSL
: SETUP TO CLEAR THE CES REGISTER

: CLEAR THE CES REGISTER
: SHUT OFF THE FLOATING POINT
: CLEAR THE SIR REGISTER
: STOP INTERVAL TIMER
: SHUT OFF THE TB

ERLOOP: D_K[.2],J/CALLCON
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:

: CALL THE CONSOLE
: ERRLOOP CALL

CALLCON: ID[TXDB]_D,J/CALLCON

: CALL THE CONSOLE

:+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

13F4:	NOP
13F5:	NOP
13F6:	NOP
13F7:	NOP
13F8:	NOP
13F9:	NOP
13FA:	NOP
13FB:	NOP
13FC:	NOP
13FD:	NOP
13FE:	NOP
13FF:	NOP
1155:	NOP
12AA:	NOP

```

: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.

```

```

SUBTST: D RC[OF],KMX/.FF00
        RC[OF]_D+K[.FF00],WORD,RETURN1

```

```

: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

```

```
SETRCF: Q_RC[OF]  
        Q_Q.AND.K[.FF00]  
        RC[OF].Q.OR.SC,RETURN1
```

```

; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
; ARE LOST.

```

```

C$OFF: D 0,0,0,ALU K[FFFF]
        =0 D D.LEFT,S177,CALL,J/DC9
          SC K[C]
          D BAL.SC
          ID[MAINT] D.RETURN1

```

```

; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.

```

COFF: D K[.3] 0-0
SC K[.F]
D DAL.SC
IB(MAINT) D

```

; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.

```

```
SOFF: SC K[C]
      ALD NOT.MASK,D,ALU
      ID[MAINT] D,RETURN1
```

```

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.

```

DC.DE: CALL J/DCD


```

U 1035, 0000,003C,0180,0800,0000,103C :1971
U 103C, 0000,003D,0180,0800,0000,1239 :1972
U 103D, 0000,003E,0180,0800,0000,0001 :1973
                                           :1974
                                           :1975
                                           :1976
                                           :1977
                                           :1978
                                           :1979
                                           :1980
                                           :1981
U 104C, 0F00,003D,0180,0800,0000,1233 :1982
U 104D, 0100,003C,0180,0800,0000,1058 :1983
U 1058, 0100,003D,0180,0800,0000,122B :1984
U 1059, 0100,003C,0180,0800,0000,105C :1985
U 105C, 0100,003D,0180,0800,0000,122C :1986
U 105D, 0800,003C,4980,3E40,0000,11F3 :1987
U 11F3, 0000,003C,4180,3C00,0000,11F4 :1988
U 11F4, 0000,003E,4DF0,2C00,0000,0001 :1989
                                           :1990
                                           :1991
U 1078, 0F00,003D,0180,0800,0000,122F :1992
U 1079, 0000,003C,0180,0800,0000,104D :1993
                                           :1994
                                           :1995
U 107A, 0F00,003D,0180,0800,0000,1233 :1996
U 107B, 0500,003C,0180,0800,0000,104D :1997
                                           :1998
U 11F5, 0818,0038,0580,0800,0000,105D :1999
                                           :2000
                                           :2001
                                           :2002
                                           :2003
                                           :2004
                                           :2005
U 1080, 0800,003D,0180,0A30,0000,122B :2006
U 1081, 0500,003C,D980,0A28,0084,7082 :2007
U 1082, 0003,0011,01C0,0800,0000,122B :2008
U 1083, 001C,0024,01C0,0800,0000,11F6 :2009
U 11F6, 081D,0030,0180,0800,0000,11F7 :2010
U 11F7, 0200,003C,0180,0800,0000,11F8 :2011
U 11F8, 0001,003E,0180,0AB8,0000,0001 :2012
                                           :2013
                                           :2014
                                           :2015
                                           :2016
                                           :2017
U 11F9, 0000,003C,0180,0A70,0000,11FA :2018
U 11FA, 0000,003C,0180,52F8,0000,11FB :2019
U 11FB, 0800,003C,69F0,2E78,0000,1200 :2020
U 1200, 0018,0038,1980,0AF8,0000,1201 :2021
U 1201, 0000,003C,0180,0A70,0000,1202 :2022
U 1202, 001C,2000,0180,0800,0010,1203 :2023
U 1203, 0000,013C,0180,0800,0000,1084 :2024
U 1084, 0001,003C,0180,09C8,0000,120C :2025

```

```

NOP
=0 CALL,J/DCE
RETURN1
: THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
: IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
: VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
: MME WILL BE SET HERE. UPON RETURN THE CONTENTS
: OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
: D AND Q ARE LOST.
: THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DC8
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWRA: ID[TBER0] D,D_R[8]
ID[TBUF] D
Q ID[TBER1],RETURN1
: ROUTINE TO WRITE GROUP 0
=0
TBWR0: D_0,CALL,J/DC4
J7TBWR
: ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DC8
D_D.LEFT,SI/ZERO,J/TBWR
: THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D_K[1],J/TBWRA
: THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
: THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
: R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
: TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
: R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC_K[9],LAB_R[5]
=0 ACU_MASK+1,Q_ALU,CALL,J/DC0
ALU_LACANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
: THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
: TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
: RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
: AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
: INDICATED IN R[E].
RELCHK: LAB_R[OE]
R[OF] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
Q ID[TIME.ADDR],D_R[OF]
ACU_0(K),R[OF],ALD
LAB_R[OE]
ALU_LAC[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
??
=0 RC[9]_D,J/TBTRUE ; TRAPPED SO RETURN1.

```



```
U 1085, 0000,003C,0180,0800,0000,1086 :2026 NOP
U 1086, 0F00,003D,0180,0800,0000,1239 :2027 =0 D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
U 1087, 0500,003C,0180,0800,0000,1204 :2028 D-D.LEFT,S1/ZERO
U 1204, 0001,003C,0180,0800,0082,1205 :2029 SC D
U 1205, 0803,0010,0180,0800,0000,1206 :2030 ALU_MASK+1,D,ALU
U 1206, 001D,2024,01C0,0800,0000,1207 :2031 ALU_Q[ANDNOT]D,Q_ALU
U 1207, 0800,003C,0180,0A38,0000,1208 :2032 D_R[7] ; SEE IF ADDRESS RELOCATED
U 1208, 0001,003C,0180,09E0,0000,1209 :2033 RC[0C]_D
U 1209, 0001,203C,0180,09D8,0000,120A :2034 RC[0B]_Q
U 120A, 001D,2000,0180,0800,0010,120B :2035 ALU_Q-D,CLK.UBCC ; PROPERLY.
U 120B, 0000,013C,0180,0800,0000,1088 :2036 Z?
U 1088, 0000,003E,0180,0800,0000,0002 :2037 =0 RETURN2 ; INCORRECT.
U 1089, 0000,003E,0180,0800,0000,0003 :2038 RETURN3 ; OK
U 120C, 0000,003C,4DF0,2C00,0000,120D :2039 TBTRUE: Q_ID[TBER1]
U 120D, 0001,203E,0180,09F0,0000,0001 :2040 RC[0E]_Q,RETURN1
:2041 ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
:2042 ; IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
:2043 ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
:2044 ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 120E, 0000,003C,0180,0A70,0000,120F :2045 MISS: LAB_R[0E]
U 120F, 0000,003C,0180,52F8,0000,1210 :2046 RC[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 1210, 0800,003C,0180,0A78,0000,1211 :2047 D_R[0F]
U 1211, 0018,0038,1980,0AF8,0000,1212 :2048 ALU_0(K),RC[0F]_ALU
U 1212, 0000,003C,0180,0A70,0000,1213 :2049 LAB_R[0E]
U 1213, 0001,003C,0180,09C8,0000,1214 :2050 RC[9]_D
U 1214, 001C,2000,0180,0800,0010,1215 :2051 ALU_L[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
U 1215, 0000,013C,0180,0800,0000,108A :2052 Z?
U 108A, 0000,003C,0180,0800,0000,1216 :2053 =0 J/MISSA
U 108B, 0000,003E,0180,0800,0000,0001 :2054 RETURN1 ; NO TRAP SO RETURN1.
U 1216, 0000,003C,D580,0800,0084,7217 :2055 MISSA: SC_K[.6] ; IF A TRAP OCCURRED SEE
U 1217, 0001,0024,0180,0800,0010,1218 :2056 ALU_D.ANDNOT.MASK,CLK.UBCC ; IF IT WAS A TB MISS TRAP.
U 1218, 0000,013C,4DF0,2C00,0000,108C :2057 Z?,Q_ID[TBER1]
U 108C, 0001,203E,0180,09F0,0000,0002 :2058 =0 RETURN2,RC[0E]_Q ; NOT TB MISS.
U 108D, 0000,003E,0180,0800,0000,0003 :2059 RETURN3 ; TB MISS.
:2060 ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
:2061 ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
:2062 ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
:2063 ; HIT/MISS BIT IN TBER0 IS INCORRECT.
:2064 ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
:2065 ; CHECK HIT IN GROUP 0.
U 1219, 0000,003C,D580,0A70,0084,721A :2066 HIT0: LAB_R[0E],SC_K[.6]
U 121A, 0000,003C,0180,52F8,0000,121B :2067 HIT: RC[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
U 121B, 0800,003C,49F0,2E78,0000,121C :2068 Q_ID[TBER0],D_R[0F]
U 121C, 0018,0038,1980,0AF8,0000,121D :2069 ALU_0(K),RC[0F]_ALU
U 121D, 0001,203C,0180,09E8,0000,121E :2070 RC[0D]_Q
U 121E, 0003,001C,0180,09F0,0000,121F :2071 RC[0E]_ALU,ALU_NOT.MASK
U 121F, 0000,003C,0180,0A70,0000,1220 :2072 LAB_R[0E]
U 1220, 001C,2000,0180,0800,0010,1221 :2073 ALU_L[A-B]D,CLK.UBCC ; SEE IF TRAP OCCURRED.
U 1221, 0001,013C,0180,09C8,0000,108E :2074 Z?,RC[9]_D
U 108E, 0000,003C,0180,0800,0000,1223 :2075 =0 J/HITA ; TRAP OCCURRED.
U 108F, 0001,2024,0180,0800,0010,1222 :2076 ALU_Q.ANDNOT.MASK,CLK.UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?
U 1222, 0000,013C,0180,0800,0000,1090 :2077 Z?
U 1090, 0000,003E,0180,0800,0000,0004 :2078 =0 RETURN4 ; SET SO IT WAS A HIT.
U 1091, 0000,003E,0180,0800,0000,0003 :2079 RETURN3 ; CLEAR SO REFERENCE WAS A MISS.
U 1223, 0000,003C,D580,0800,0084,7224 :2080 HITA: SC_K[.6] ; TRAPPED, SO SEE IF TB MISS TRAP.
```

```
U 1224. 0001,0024,0180,0800,0010,1225 :2081      ALU_D.ANDNOT.MASK,CLK.UBCC
U 1225. 0000,013C,0180,0800,0000,1092 :2082      Z?
U 1092. 0000,003C,0180,0800,0000,120C :2083      =0      J/TBTRUE      ; NOT TB MISS TRAP.
U 1093. 0000,003E,0180,0800,0000,0002 :2084      RETURN2      ; TB MISS TRAP OCCURRED.
:2085      ; CHECK HIT IN GROUP 1.
U 1226. 0000,003C,5D80,0A70,0084,721A :2086      HIT1: LAB_R[OE],SC_K[.7],J/HIT
:2087      ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1227. 0118,0038,1B80,0800,0000,123B :2088      S00: ALU_0(K),D_D.LEFT2,S1/7,J/SX
U 1228. 0118,0038,0B80,0800,0000,123B :2089      S01: ALU_K[.2],D_D.LEFT2,S1/7,J/SX
U 1229. 0118,0038,0780,0800,0000,123B :2090      S10: ALU_K[.1],D_D.LEFT2,S1/7,J/SX
U 122A. 0118,0038,C380,0800,0000,123B :2091      S11: ALU_K[.FFFF],D_D.LEFT2,S1/7,J/SX
U 122B. 0018,0038,1980,0800,0000,1227 :2092      DC0: ALU_0(K),J/S00
U 122C. 0018,0038,1980,0800,0000,1228 :2093      DC1: ALU_0(K),J/S01
U 122D. 0018,0038,1980,0800,0000,1229 :2094      DC2: ALU_0(K),J/S10
U 122E. 0018,0038,1980,0800,0000,122A :2095      DC3: ALU_0(K),J/S11
U 122F. 0018,0038,0980,0800,0000,1227 :2096      DC4: ALU_K[.2],J/S00
U 1230. 0018,0038,0980,0800,0000,1228 :2097      DC5: ALU_K[.2],J/S01
U 1231. 0018,0038,0980,0800,0000,1229 :2098      DC6: ALU_K[.2],J/S10
U 1232. 0018,0038,0980,0800,0000,122A :2099      DC7: ALU_K[.2],J/S11
U 1233. 0018,0038,0580,0800,0000,1227 :2100      DC8: ALU_K[.1],J/S00
U 1234. 0018,0038,0580,0800,0000,1228 :2101      DC9: ALU_K[.1],J/S01
U 1235. 0018,0038,0580,0800,0000,1229 :2102      DCA: ALU_K[.1],J/S10
U 1236. 0018,0038,0580,0800,0000,122A :2103      DCB: ALU_K[.1],J/S11
U 1237. 0018,0038,C180,0800,0000,1227 :2104      DCC: ALU_K[.FFFF],J/S00
U 1238. 0018,0038,C180,0800,0000,1228 :2105      DCD: ALU_K[.FFFF],J/S01
U 1239. 0018,0038,C180,0800,0000,1229 :2106      DCE: ALU_K[.FFFF],J/S10
U 123A. 0018,0038,C180,0800,0000,122A :2107      DCF: ALU_K[.FFFF],J/S11
U 123B. 0100,003E,0380,0800,0000,0001 :2108      SX: D_D.LEFT2,S1/7,RETURN1
U 123C. 0018,0038,01C0,0800,0000,1094 :2109      DC.5: Q_K[.8]
:2110      =0
U 1094. 0000,003D,0180,0800,0000,1230 :2111      DC.5A: CALL,J/DC5
U 1095. 0019,2000,05C0,0800,0010,123D :2112      ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 123D. 0000,013C,0180,0800,0000,1096 :2113      Z?
U 1096. 0000,003C,0180,0800,0000,1094 :2114      =0      J/DC.5A
U 1097. 0000,003E,0180,0800,0000,0001 :2115      RETURN1
:2116      =0
U 1098. 0000,003D,0180,0800,0000,123C :2117      DC.A: CALL,J/DC.5
U 1099. 0500,003E,0180,0800,0000,0001 :2118      D_D.LEFT,S1/ZERO,RETURN1
U 123E. 0018,0038,01C0,0800,0000,109A :2119      DC.9: Q_K[.8]
:2120      =0
U 109A. 0000,003D,0180,0800,0000,1234 :2121      DC.9A: CALL,J/DC9
U 109B. 0019,2000,05C0,0800,0010,123F :2122      ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 123F. 0000,013C,0180,0800,0000,10A0 :2123      Z?
U 10A0. 0000,003C,0180,0800,0000,109A :2124      =0      J/DC.9A
U 10A1. 0000,003E,0180,0800,0000,0001 :2125      RETURN1
:2126      =0
U 10A2. 0000,003D,0180,0800,0000,123E :2127      DC.C: CALL,J/DC.9
U 10A3. 0018,0038,C180,0800,0000,1240 :2128      ALU_K[.FFFF]
U 1240. 0600,003E,0380,0800,0000,0001 :2129      D_D.RIGHT,S1/7,RETURN1
:2130      =0
U 10A4. 0000,003D,0180,0800,0000,123E :2131      DC.6: CALL,J/DC.9
U 10A5. 0018,0038,0580,0800,0000,1241 :2132      ALU_K[.1]
U 1241. 0100,003E,0380,0800,0000,0001 :2133      D_D.LEFT2,S1/7,RETURN1
:2134      =0
U 10A6. 0000,003D,0180,0800,0000,123E :2135      DC.3: CALL,J/DC.9
```

U 10A7, 0018,0038,C180,0800,0000,1242 :2136
U 1242, 0500,003E,0380,0800,0000,0001 :2137

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U 1243, 0F18,0038,0580,0800,0000,1244 :2168
U 1244, 0218,0038,0880,0800,0000,1245 :2169
U 1245, 0218,0038,0880,0800,0000,1246 :2170
U 1246, 0200,003C,0380,0800,0000,1247 :2171
U 1247, 0001,003C,0180,0AE0,0000,1248 :2172

U 1248, 0000,003C,6180,0800,0084,7249 :2173
U 1249, 0043,0010,0180,0AD8,0000,124A :2174
U 124A, 081B,0000,0580,0800,0000,124B :2175
U 124B, 0018,0038,21C0,0800,0000,124C :2176
U 124C, 0019,2014,0580,0800,0082,124D :2177

U 124D, 0003,001C,01C0,0800,0000,124E :2178
U 124E, 001D,2014,0180,0AE8,0000,10A8 :2179
U 10A8, 0000,003D,0180,0800,0000,123C :2180
U 10A9, 0000,003C,0180,0A68,0000,124F :2181

U 124F, 081C,2034,0180,0800,0000,1250 :2182
U 1250, 081C,203C,0180,0A60,0000,1251 :2183
U 1251, 0001,003C,0180,0980,0000,10AA :2184
U 10AA, 0001,003D,0180,0AB0,0000,10A2 :2185

U 10AB, 0000,003C,0180,0A58,0000,1252 :2186
U 1252, 081C,2034,0180,0988,0000,10AC :2187
U 10AC, 0001,003D,0180,0AA8,0000,1080 :2188
U 10AD, 0001,003C,0180,0990,0000,10AE :2189

U 10AE, 0000,003D,0180,0800,0000,123E :2190
U 10AF, 0000,003C,0180,0A68,0000,1253 :2191
U 1253, 081C,2034,0180,0800,0000,1254 :2192

U 1254, 081C,2030,0180,0A60,0000,1255 :2193
U 1255, 0001,003C,0180,0998,0000,10B0 :2194
U 10B0, 0001,003D,0180,0AB0,0000,123C :2195

ALU_K[FFFF]
D D LEFT,SI/7,RETURN1
: THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
: A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
: SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
: FOLLOWING DATA PATTERNS:

: R[0B] 7FFFC000
: R[0C] A4000000
: R[0D] 001FFFFFF

: R[0] A4155555
: R[1] 4CCCC000
: R[2] 0AAAAA80

: R[3] A4199999
: R[4] 55554000
: R[5] 0CCCCC80

: R[6] A40AAAAA
: R[7] 33330000
: R[8] 05555500

: R[0] A4066666
: R[1] 2AAA8000
: R[2] 03333300

TBWPTP: D_0,ALU_K[.1]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7

R[0C] D
SC_K[.F]
ALU_MASK+1,R[0B]_ALU.RIGHT,SI/ZERO
D_0=K[.1]

Q_K[.14]
A[U_Q+K[.1],SC_ALU
ALU_NOT.MASK,Q_ALU
ALU_Q[A+B]D,R[0D]_ALU

=0 CALL,J/DC.5
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_[A[OR]D,D_ALU

R[0] D
=0 R[6] D,CALL,J/DC.C
LAB_R[0B]
ALU_LA[AND]D,D_ALU,R[1]_ALU

=0 R[5] D,CALL,J/RELSUB
R[2] D
=0 CALL,J/DC.9
LAB_R[0D]

ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_[A[OR]D,D_ALU
R[3] D
=0 R[6] D,CALL,J/DC.5

Address	Instruction	Comment
U 10B1	0000,003C,0180,0A58,0000,1256	:2191 LAB_R[0B]
U 1256	081C,2034,0180,09A0,0000,10B2	:2192 ALU_LA[AND]D,D,ALU,R[4]_ALU
U 10B2	0001,003D,0180,0AA8,0000,1080	:2193 =0 R[5] D,CALL,J/RELSUB
U 10B3	0001,003C,0180,09A8,0000,10B4	:2194 RC[5] D
U 10B4	0000,003D,0180,0800,0000,1098	:2195 =0 CALL,J/DC.A
U 10B5	0000,003C,0180,0A68,0000,1257	:2196 LAB_R[0D]
U 1257	081C,2034,0180,0800,0000,1258	:2197 ALU_LA[AND]D,D,ALU
U 1258	081C,2030,0180,0A60,0000,1259	:2198 LAB_R[0C],ALU_[A[OR]D,D,ALU
U 1259	0001,003C,0180,09B0,0000,10B6	:2199 RC[6] D
U 10B6	0001,003D,0180,0AB0,0000,10A6	:2200 =0 R[6] D,CALL,J/DC.3
U 10B7	0000,003C,0180,0A58,0000,125A	:2201 LAB_R[0B]
U 125A	081C,2034,0180,09B8,0000,10B8	:2202 ALU_LA[AND]D,D,ALU,R[7]_ALU
U 10B8	0001,003D,0180,0AA8,0000,1080	:2203 =0 R[5] D,CALL,J/RELSUB
U 10B9	0001,003C,0180,09C0,0000,10BA	:2204 RC[8] D
U 10BA	0000,003D,0180,0800,0000,10A4	:2205 =0 CALL,J/DC.6
U 10BB	0000,003C,0180,0A68,0000,125B	:2206 LAB_R[0D]
U 125B	081C,2034,0180,0800,0000,125C	:2207 ALU_LA[AND]D,D,ALU
U 125C	081C,2030,0180,0A60,0000,125D	:2208 LAB_R[0C],ALU_[A[OR]D,D,ALU
U 125D	0001,003C,0180,0A80,0000,10C0	:2209 RC[0] D
U 10C0	0001,003D,0180,0AB0,0000,1098	:2210 =0 R[6] D,CALL,J/DC.A
U 10C1	0000,003C,0180,0A58,0000,125E	:2211 LAB_R[0B]
U 125E	081C,2034,0180,0A88,0000,10C2	:2212 ALU_LA[AND]D,D,ALU,R[1]_ALU
U 10C2	0001,003D,0180,0AA8,0000,1080	:2213 =0 R[5] D,CALL,J/RELSUB
U 10C3	0001,003E,0180,0A90,0000,0001	:2214 RC[2] D,RETURN1
		:2215 ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
		:2216 ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
		:2217 ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 125F	0000,003F,0180,0800,0000,117C	:2218 TARGC3: SUB/SPEC
U 117C	0000,003E,0180,0800,0000,0001	:2219 117C: RETURN1
U 117D	0000,003E,0180,0800,0000,0002	:2220 117D: RETURN2
U 117E	0000,003E,0180,0800,0000,0003	:2221 117E: RETURN3
U 117F	0000,003E,0180,0800,0000,0004	:2222 117F: RETURN4
U 11FC	0000,003D,0180,0800,0000,11E0	:2223 11FC: ERROR1
U 11FD	0000,003D,0180,0800,0000,11E0	:2224 11FD: ERROR1
U 11FE	0000,003D,0180,0800,0000,11E0	:2225 11FE: ERROR1
U 11FF	0000,003D,0180,0800,0000,11E0	:2226 11FF: ERROR1


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:2240
:2241
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U 10C4, 0000,003D,0180,0800,0000,11CC
U 10C5, 0F00,003C,0180,0800,0000,1260
U 1260, 0000,003C,4980,3C00,0000,10C6
U 10C6, 0F00,003D,0180,0800,0000,1034
U 10C7, 0001,003C,0180,0AF0,0000,10C8
U 10C8, 0018,0039,0980,09F8,0000,11E9
U 10C9, 0000,003C,0180,0800,0000,10CA

U 10CA, 0000,003D,0180,0800,0000,11E4
U 10CB, 0018,0038,0980,09E8,0000,10CC

```

.PAGE "TEST AC ALIGN UTRAP LOGIC TEST"
*****
++
TEST AC ALIGN UTRAP LOGIC TEST

TEST DESCRIPTION
THIS IS A TEST OF THE UNALIGNED DATA TRAP LOGIC ON THE TBM
AND CEH. NOTICE THAT THIS TEST CAN BE (AND IS!) RUN
WITH THE TB DISABLED, MME=0.
THE FOLLOWING CONDITIONS ARE TESTED:
SUBTEST 1 VA<1:0>=0 AND DT/LONG
SUBTEST 2 VA<1:0>=1 AND DT/LONG
SUBTEST 3 VA<1:0>=2 AND DT/LONG
SUBTEST 4 VA<1:0>=2, DT/LONG AND MSC/SECOND REF
SUBTEST 5 VA<1:0>=1 AND DT/WORD
SUBTEST 6 VA<1:0>=2 AND DT/WORD
SUBTEST 7 VA<1:0>=3 AND DT/WORD

ERROR DESCRIPTION
UTRAP FLAG UTRAP TYPE
-----
DE NO UTRAP OCCURRED
5E TB PARITY ERROR
9E TB MISS
CE TB PROTECTION ERROR
D6 TB MODIFY BIT ERROR
DA X PAGE UTRAP
DC UNALIGNED DATA UTRAP

ERROR CODE:
3=>BRANCH FAILURE
2=> TRAP ERROR

(NOTE THAT OTHER INFORMATION IS STATED
EXPLICITELY IN EACH SUBTEST BELOW)

--
*****
=0
ALIGN: NEWTST
D 0
ID[ TBER0 ] D ; TURN OFF MME
=0 D 0,CALL,J/DC.DE
R[OE] D ; R[OE]=DE THE UTRAP FLAG
=0 RC[OF]_K[.2],CALL,J/COFF ; TURN OFF THE CACHE AND SBI
NOP
////////////////////////////////////
+
FIRST TEST THE CONDITION WITH VA<1:0>=00 AND DATA TYPE=LONG
WHICH SHOULDN'T TRAP.
-
=0
ALIGN1: SUBTEST
RC[OD]_K[.2]

```

```

U 10CC. 0000,003D,0180,0800,0000,11DF :2282
U 10CD. 0018,0038,1980,0800,0200,1261 :2283
U 1261. 0000,003C,0180,0A70,0000,1262 :2284
U 1262. 0000,003C,0180,0AF8,0000,1263 :2285
U 1263. 0000,003C,0180,5000,0000,1264 :2286
U 1264. 0800,003C,0180,0A78,0000,1265 :2287
U 1265. 0003,003C,0180,0AF8,0000,1266 :2288
U 1266. 0001,003C,0180,09F0,0000,1267 :2289
U 1267. 0000,003C,0180,0A70,0000,1268 :2290
U 1268. 001C,2000,0180,0800,0010,1269 :2291
U 1269. 0000,013C,0180,0800,0000,10CE :2292
U 10CE. 0000,003C,0180,0800,0000,126A :2293
U 10CF. 0000,003C,0180,0800,0000,126C :2294
U 126A. 0019,0034,0980,0800,0010,126B :2295
U 126B. 0000,013C,0180,0800,0000,10D0 :2296
U 10D0. 0000,003D,0180,0800,0000,11E0 :2297
U 10D1. 0000,003D,0180,0800,0000,11E0 :2298
U 126C. 0000,003C,0180,1000,0000,126D :2299
U 126D. 0000,1D3C,0180,0800,0000,1017 :2300
U 1017. 0018,0039,0980,09E8,0000,11E0 :2301
U 101F. 0000,003C,0180,0800,0000,10D2 :2302
:2303
:2304
:2305
:2306
:2307
U 10D2. 0000,003D,0180,0800,0000,11E4 :2308
U 10D3. 0018,0038,0980,09E8,0000,10D4 :2309
U 10D4. 0000,003D,0180,0800,0000,11DF :2310
U 10D5. 0018,0038,0580,0800,0200,126E :2311
U 126E. 0000,003C,0180,0A70,0000,126F :2312
U 126F. 0000,003C,0180,0AF8,0000,1270 :2313
U 1270. 0000,003C,0180,5000,0000,1271 :2314
U 1271. 0800,003C,0180,0A78,0000,1272 :2315
U 1272. 0003,003C,0180,0AF8,0000,1273 :2316
U 1273. 0001,003C,0180,09F0,0000,1274 :2317
U 1274. 0000,003C,0180,0A70,0000,1275 :2318
U 1275. 001C,2000,0180,0800,0010,1276 :2319
U 1276. 0000,013C,0180,0800,0000,10D6 :2320
U 10D6. 0000,003C,0180,0800,0000,1277 :2321
U 10D7. 0000,003D,0180,0800,0000,11E0 :2322
U 1277. 0019,0034,0980,0800,0010,1278 :2323
U 1278. 0000,013C,0180,0800,0000,10D8 :2324
U 10D8. 0000,003D,0180,0800,0000,11E0 :2325
U 10D9. 0000,003C,0180,0800,0000,1279 :2326
U 1279. 0000,003C,0180,1000,0000,127A :2327
U 127A. 0000,1D3C,0180,0800,0000,1037 :2328
U 1037. 0000,003C,0180,0800,0000,10DA :2329
U 103F. 0018,0039,0D80,09E8,0000,11E0 :2330
:2331
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```

```

=0 ERLOOP
VA_K[ZERO] ; VA=0
LAB_R[OE]
R[OF] LA ; SET UP THE TRAP FLAG
DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULD N'T TRAP.
D R[OF] ; SEE IF A UTRAP OCCURRED.
R[OF] 0
R[OE] D
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC
Z?
=0 J/AL1A ; UTRAPPED
J/ALIGN15 ; OK, DIDN'T UTRAP
AL1A: ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE TRAP WAS AN ALIGNMENT ERROR
Z?
=0 ERROR1 ; NON ALIGNMENT UTRAP
ERROR1 ; ALIGNMENT UTRAP OCCURRED.
ALIGN15: DT/LONG,FS/MCT,MCT/TEST.WCHK ; NOW TEST BRANCH TB.TEST
BEN/TB.TEST
=10111 ERROR1,R[OD]_K[.2] ; BRANCH TB.TEST FAILED
NOP
:////////////////////////
:
: TEST VA<1:0>=01 AND DT=LONG, A CONDITION WHICH SHOULD TRAP.
:
:
=0
ALIGN2: SUBTEST
R[OD]_K[.2]
=0 ERLOOP
VA_K[.1] ; VA=1
LAB_R[OE]
R[OF] LA ; SET THE UTRAP FLAG
DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP.
D R[OF] ; SEE IF THE TRAP OCCURRED
R[OF] 0
R[OE] D
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC
Z?
=0 J/AL2A ; OK UTRAPPED
ERROR1 ; REFERENCE DIDN'T UTRAP
AL2A: ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS AN ALIGNMENT ERROR
Z?
=0 ERROR1 ; NON ALIGNMENT UTRAP
NOP ; ALIGNMENT UTRAP OCCURRED.
DT/LONG,FS/MCT,MCT/TEST.WCHK ; NOW CHECK BRANCH TB.TEST
BEN/TB.TEST
=10111 J/ALIGN3
ERROR1,R[OD]_K[.3] ; BRANCH TB.TEST FAILED AFTER
; AN ALIGNMENT ERROR
:////////////////////////
:
: TEST VA<1:0>=10 AND DT=LONG, WHICH SHOULD TRAP.
:
:
=0

```

```

U 10DA, 0000,003D,0180,0800,0000,11E4 :2337
U 10DB, 0018,0038,0980,09E8,0000,10E0 :2338
U 10E0, 0000,003D,0180,0800,0000,11DF :2339
U 10E1, 0018,0038,0980,0800,0200,127B :2340
U 127B, 0000,003C,0180,0A70,0000,127C :2341
U 127C, 0000,003C,0180,0AF8,0000,127D :2342
U 127D, 0000,003C,0180,5000,0000,127E :2343
U 127E, 0800,003C,0180,0A78,0000,127F :2344
U 127F, 0003,003C,0180,0AF8,0000,1280 :2345
U 1280, 0001,003C,0180,09F0,0000,1281 :2346
U 1281, 0000,003C,0180,0A70,0000,1282 :2347
U 1282, 001C,2000,0180,0800,0010,1283 :2348
U 1283, 0000,013C,0180,0800,0000,10E2 :2349
U 10E2, 0000,003C,0180,0800,0000,1284 :2350
U 10E3, 0000,003D,0180,0800,0000,11E0 :2351
U 1284, 0019,0034,0980,0800,0010,1285 :2352
U 1285, 0000,013C,0180,0800,0000,10E4 :2353
U 10E4, 0000,003D,0180,0800,0000,11E0 :2354
U 10E5, 0000,003C,0180,0800,0000,10E6 :2355
:2356
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:2360
:2361
U 10E6, 0000,003D,0180,0800,0000,11E4 :2362
U 10E7, 0000,003C,0180,0800,0000,10E8 :2363
U 10E8, 0000,003D,0180,0800,0000,11DF :2364
U 10E9, 0018,0038,0980,0800,0200,1286 :2365
U 1286, 0000,003C,0180,0A70,0000,1287 :2366
U 1287, 0000,003C,0180,0AF8,0000,1288 :2367
U 1288, 0000,003C,0180,5000,3000,1289 :2368
U 1289, 0800,003C,0180,0A78,0000,128A :2369
U 128A, 0003,003C,0180,0AF8,0000,128B :2370
U 128B, 0001,003C,0180,09F0,0000,128C :2371
U 128C, 0000,003C,0180,0A70,0000,128D :2372
U 128D, 001C,2000,0180,0800,0010,128E :2373
U 128E, 0000,013C,0180,0800,0000,10EA :2374
U 10EA, 0000,003C,0180,0800,0000,128F :2375
U 10EB, 0000,003C,0180,0800,0000,10EE :2376
U 128F, 0019,0034,0980,0800,0010,1290 :2377
U 1290, 0000,013C,0180,0800,0000,10EC :2378
U 10EC, 0000,003D,0180,0800,0000,11E0 :2379
U 10ED, 0000,003D,0180,0800,0000,11E0 :2380
:2381
:2382
:2383
:2384
:2385
U 10EE, 0000,003D,0180,0800,0000,11E4 :2386
U 10EF, 0000,003C,0180,0800,0000,10F0 :2387
U 10F0, 0000,003D,0180,0800,0000,11DF :2388
U 10F1, 0018,0038,0980,0800,0200,1291 :2389
U 1291, 0000,003C,0180,0A70,0000,1292 :2390
U 1292, 0000,003C,0180,0AF8,0000,1293 :2391

```

```

ALIGN3: SUBTEST
=0  RC[OD]_K[.2]
      ERLOOP
      VA_K[.2] : VA=2
      LAB_R[OE]
      R[OF]_LA : SET UP UTRAP FLAG
      DT/LONG,FS/MCT,MCT/READ.V.WCHK : SHOULD TRAP.
      D_R[OF] : SEE IF THE TRAP OCCURRED
      R[OF]_0
      RC[OE]_D
      LAB_R[OE]
      ALU_LA[A-B]D,CLK.UBCC
      Z?
=0  J/AL3A : UTRAPPED
      ERROR1 : NO UTRAP OCCURRED
AL3A: ALU_D[AND]K[.2],CLK.UBCC : SEE IF THE UTRAP WAS AN ALIGNMENT ERROR
      Z?
=0  ERROR1 : NON ALIGNMENT UTRAP
      NOP : ALIGNMENT UTRAP OCCURRED.
:////////////////////
:
: TEST VA<1:0>=10 AND DT=LONG WITH MSC=SECOND REFERENCE. THIS
: SHOULDN'T TRAP.
:
:
=0
ALIGN4: SUBTEST
NOP
=0  ERLOOP
      VA_K[.2] : VA=2
      LAB_R[OE]
      R[OF]_LA : SET UP THE UTRAP FLAG
      DT/LONG,FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF : SHOULDN'T TRAP.
      D_R[OF]
      R[OF]_0
      RC[OE]_D
      LAB_R[OE]
      ALU_LA[A-B]D,CLK.UBCC
      Z?
=0  J/AL4A : UTRAPPED
      J/ALIGN5 : OK, DIDN'T UTRAP
AL4A: ALU_D[AND]K[.2],CLK.UBCC
      Z?
=0  ERROR1 : NON ALIGNMENT UTRAP
      ERROR1 : ALIGNMENT UTRAP OCCURRED
      : ON SECOND REFERENCE.
:
: TEST VA<1:0>=01 AND DT=WORD, WHICH SHOULDN'T TRAP.
:
:
=0
ALIGN5: SUBTEST
NOP
=0  ERLOOP
      VA_K[.1]
      LAB_R[OE]
      R[OF]_LA

```


U 1293, 0000,403C,0180,5000,0000,1294 :2392
U 1294, 0800,003C,0180,0A78,0000,1295 :2393
U 1295, 0003,003C,0180,0AF8,0000,1296 :2394
U 1296, 0001,003C,0180,09F0,0000,1297 :2395
U 1297, 0000,003C,0180,0A70,0000,1298 :2396
U 1298, 001C,2000,0180,0800,0010,1299 :2397
U 1299, 0000,013C,0180,0800,0000,10F2 :2398
U 10F2, 0000,003C,0180,0800,0000,129A :2399
U 10F3, 0000,003C,0180,0800,0000,10F6 :2400
U 129A, 0019,0034,0980,0800,0010,129B :2401
U 129B, 0000,013C,0180,0800,0000,10F4 :2402
U 10F4, 0000,003D,0180,0800,0000,11E0 :2403
U 10F5, 0000,003D,0180,0800,0000,11E0 :2404

U 10F6, 0000,003D,0180,0800,0000,11E4 :2405
U 10F7, 0000,003C,0180,0800,0000,10F8 :2406
U 10F8, 0000,003D,0180,0800,0000,11DF :2407
U 10F9, 0018,0038,0980,0800,0200,129C :2408
U 129C, 0000,003C,0180,0A70,0000,129D :2409
U 129D, 0000,003C,0180,0AF8,0000,129E :2410
U 129E, 0000,403C,0180,5000,0000,129F :2411
U 129F, 0800,003C,0180,0A78,0000,12A0 :2412
U 12A0, 0003,003C,0180,0AF8,0000,12A1 :2413
U 12A1, 0001,003C,0180,09F0,0000,12A2 :2414
U 12A2, 0000,003C,0180,0A70,0000,12A3 :2415
U 12A3, 001C,2000,0180,0800,0010,12A4 :2416
U 12A4, 0000,013C,0180,0800,0000,10FA :2417
U 10FA, 0000,003C,0180,0800,0000,12A5 :2418
U 10FB, 0000,003C,0180,0800,0000,1110 :2419
U 12A5, 0019,0034,0980,0800,0010,12A6 :2420
U 12A6, 0000,013C,0180,0800,0000,110A :2421
U 110A, 0000,003D,0180,0800,0000,11E0 :2422
U 110B, 0000,003D,0180,0800,0000,11E0 :2423

U 1110, 0000,003D,0180,0800,0000,11E4 :2424
U 1111, 0000,003C,0180,0800,0000,1112 :2425
U 1112, 0000,003D,0180,0800,0000,11DF :2426
U 1113, 0018,0038,0D80,0800,0200,12A7 :2427
U 12A7, 0000,003C,0180,0A70,0000,12A8 :2428
U 12A8, 0000,003C,0180,0AF8,0000,12A9 :2429
U 12A9, 0000,403C,0180,5000,0000,12AB :2430
U 12AB, 0800,003C,0180,0A78,0000,12AC :2431
U 12AC, 0003,003C,0180,0AF8,0000,12AD :2432
U 12AD, 0001,003C,0180,09F0,0000,12AE :2433
U 12AE, 0000,003C,0180,0A70,0000,12AF :2434
U 12AF, 001C,2000,0180,0800,0010,12B0 :2435
U 12B0, 0000,013C,0180,0800,0000,1114 :2436
U 1114, 0000,003C,0180,0800,0000,12B1 :2437
U 1115, 0000,003D,0180,0800,0000,11E0 :2438

DT/WORD,FS/MCT,MCT/READ.V.WCHK ; SHOULDN'T TRAP.
D R[OF]
R[OF] 0
RC[OE] D
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC
Z?
=0 J/AL5A ; UTRAPPED
J/ALIGN6 ; OK, DIDN'T UTRAP
AL5A: ALU_D[AND]K[.2],CLK.UBCC
Z?
=0 ERROR1 ; NON ALIGNMENT UTRAP
ERROR1 ; ALIGNMENT UTRAP OCCURRED.
:+
: TEST VA<1:0>=10 AND DT=WORD, WHICH SHOULDN'T TRAP.
:-
=0
ALIGN6: SUBTEST
NOP
=0 ERLOOP
VA K[.2]
LAB_R[OE]
R[OF] LA
DT/WORD,FS/MCT,MCT/READ.V.WCHK ; SHOULDN'T TRAP.
D R[OF]
R[OF] 0
RC[OE] D
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC
Z?
=0 J/AL6A ; UTRAPPED
J/ALIGN7 ; OK, DIDN'T UTRAP
AL6A: ALU_D[AND]K[.2],CLK.UBCC
Z?
=0 ERROR1 ; NON ALIGNMENT UTRAP
ERROR1 ; ALIGNMENT UTRAP OCCURRED.
:+
: TEST VA<1:0>=11 AND DT=WORD, WHICH SHOULD TRAP.
:-
=0
ALIGN7: SUBTEST
NOP
=0 ERLOOP
VA K[.3]
LAB_R[OE]
R[OF] LA
DT/WORD,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP.
D R[OF]
R[OF] 0
RC[OE] D
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC
Z?
=0 J/AL7A ; UTRAPPED
ERROR1 ; OK, DIDN'T UTRAP

B 4

SEQ 0448
Page 6

```
AL7A:    ALU_D[AND]K[.2],CLK.UBCC
          Z?
=0       ERROR1
          NOP
```

```
; NON ALIGNMENT UTRAP
; ALIGNMENT UTRAP OCCURRED.
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22-
ESN

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:2451 .PAGE "TEST AD CROSS PAGE UTRAP USING DT/LONG TEST"
:2452 *****
:2453 ++
:2454 TEST AD CROSS PAGE UTRAP USING DT/LONG TEST
:2455
:2456 TEST DESCRIPTION
:2457 THIS IS A TEST OF THE CROSS PAGE ERROR DETECTION LOGIC
:2458 IN THE TB USING DT=LONG.
:2459
:2460 ERROR DESCRIPTION
:2461 VA USED IN TEST
:2462 UTRAP FLAG
:2463 FLAG UTRAP TYPE
:2464 ----
:2465 DE NO UTRAP OCCURRED
:2466 SE TB PARITY ERROR
:2467 9E TB MISS
:2468 CE TB PROTECTION ERROR
:2469 D6 TB MODIFY BIT ERROR
:2470 DA X PAGE UTRAP
:2471 DC UNALIGNED DATA UTRAP
:2472
:2473 --
:2474 *****
:2475 =0
:2476 LEDGE: NEWTST
:2477 RC[0F],K[.2]
:2478 =0 CALL,J/TBWPTP
:2479 D,K[.3FF]
:2480 D-D.RIGHT,SI/ZERO
:2481 R[1] D
:2482 ALU D[ANDNOT]K[.3],R[2],ALU
:2483 Q R[1]
:2484 ACU Q[OR]D,R[3],ALU
:2485 R[0],K[.8]
:2486 =0 CALL,J/CSOFF
:2487 VA,R[1]
:2488 LC,R[0]
:2489 =0 R[8],LC,CALL,J/TBWRB
:2490 D 0
:2491 =0 CALL,J/DC.DE
:2492 R[OE] D
:2493 =0 ERLOOP
:2494 LEDGE1: SC,R[0]
:2495 D,R[3]
:2496 ACU D.AND.MASK,D,ALU,VA,ALU,R[OE],ALU
:2497 Q,R[2]
:2498 ACU Q[ANDNOT]D,CLK.UBCC
:2499 Z?
:2500 =0 J/LEDGE2 ; EXPECT NO TRAP
:2501 ALU D[AND]K[.3],CLK.UBCC
:2502 Z?
:2503 =0 J/LEDGE5 ; EXPECT A TRAP
:2504 J/LEDGE3 ; EXPECT NO TRAP
:2505 LEDGE2: NOP ; SIMPLIFIES FAILCHAIN CLOCKING
    
```

```

U 1118, 0000,003D,0180,0800,0000,11CC
U 1119, 0018,0038,0980,09F8,0000,111A
U 111A, 0000,003D,0180,0800,0000,1243
U 111B, 0818,0038,8180,0800,0000,12B3
U 12B3, 0600,003C,0180,0800,0000,12B4
U 12B4, 0001,003C,0180,0A88,0000,12B5
U 12B5, 0019,0024,0D80,0A90,0000,12B6
U 12B6, 0010,0038,01C0,0908,0000,12B7
U 12B7, 001D,2030,0180,0A98,0000,12B8
U 12B8, 0018,0038,0180,0A80,0000,1120
U 1120, 0000,003D,0180,0800,0000,11E9
U 1121, 0010,0038,0180,0908,0200,12B9
U 12B9, 0000,003C,0180,0900,0000,1122
U 1122, 0010,0039,0180,0AC0,0000,107A
U 1123, 0F00,003C,0180,0800,0000,1124
U 1124, 0000,003D,0180,0800,0000,1034
U 1125, 0001,003C,0180,0AF0,0000,1126
U 1126, 0000,003D,0180,0800,0000,11DF
U 1127, 0000,003C,0180,0A00,0082,12BA
U 12BA, 0800,003C,0180,0A18,0000,12BB
U 12BB, 0801,0034,0180,09F0,0200,12BC
U 12BC, 0000,003C,01C0,0A10,0000,12BD
U 12BD, 001D,2024,0180,0800,0010,12BE
U 12BE, 0000,013C,0180,0800,0000,1128
U 1128, 0000,003C,0180,0800,0000,12C0
U 1129, 0019,0034,0D80,0800,0010,12BF
U 12BF, 0000,013C,0180,0800,0000,112A
U 112A, 0000,003C,0180,0800,0000,12CF
U 112B, 0000,003C,0180,0800,0000,12C2
U 12C0, 0000,003C,0180,0800,0000,12C1
    
```

U 12C1.	0000,003C,0180,0800,0000,12C2	:2506
U 12C2.	0000,003C,0180,0A70,0000,12C3	:2507
U 12C3.	0000,003C,0180,0AF8,0000,12C4	:2508
U 12C4.	0000,003C,0180,5000,0000,12C5	:2509
U 12C5.	0800,003C,0180,0A78,0000,12C6	:2510
U 12C6.	0003,003C,0180,0AF8,0000,12C7	:2511
U 12C7.	0001,003C,0180,09E8,0000,12C8	:2512
U 12C8.	0000,003C,01C0,0A70,0000,12C9	:2513
U 12C9.	001D,2000,0180,0800,0010,12CA	:2514
U 12CA.	0000,013C,0180,0800,0000,112C	:2515
U 112C.	0000,003C,0180,0800,0000,12CB	:2516
U 112D.	0000,003C,0180,0800,0000,12DA	:2517
U 12CB.	0019,0034,1180,0800,0010,12CC	:2518
U 12CC.	0000,013C,0180,0800,0000,112E	:2519
U 112E.	0000,003C,0180,0800,0000,12CD	:2520
U 112F.	0000,003D,0180,0800,0000,11E0	:2521
U 12CD.	0019,0034,0980,0800,0010,12CE	:2522
U 12CE.	0000,013C,0180,0800,0000,1130	:2523
U 1130.	0000,003D,0180,0800,0000,11E0	:2524
U 1131.	0000,003C,0180,0800,0000,12DA	:2525
U 12CF.	0000,003C,0180,0A70,0000,12D0	:2526
U 12D0.	0000,003C,0180,0AF8,0000,12D1	:2527
U 12D1.	0000,003C,0180,5000,0000,12D2	:2528
U 12D2.	0800,003C,0180,0A78,0000,12D3	:2529
U 12D3.	0003,003C,0180,0AF8,0000,12D4	:2530
U 12D4.	0001,003C,0180,09E8,0000,12D5	:2531
U 12D5.	0000,003C,01C0,0A70,0000,12D6	:2532
U 12D6.	001D,2000,0180,0800,0010,12D7	:2533
U 12D7.	0000,013C,0180,0800,0000,1132	:2534
U 1132.	0000,003C,0180,0800,0000,12D8	:2535
U 1133.	0000,003D,0180,0800,0000,11E0	:2536
U 12D8.	0019,0034,1180,0800,0010,12D9	:2537
U 12D9.	0000,013C,0180,0800,0000,1134	:2538
U 1134.	0000,003D,0180,0800,0000,11E0	:2539
U 1135.	0000,003C,0180,0800,0000,12DA	:2540
U 12DA.	0000,003C,0180,0A00,0010,12DB	:2541
U 12DB.	0000,013C,0180,0800,0000,1136	:2542
U 1136.	0018,0000,0580,0A80,0000,1127	:2543
U 1137.	0000,003C,0180,0800,0000,1138	:2544

```

NOP
LEDGE3: LAB R[OE]
        R[OF] LA
        DT/LONG,FS/MCT,MCT/READ.V.WCHK           ; SHOULDN'T TRAP.
        D R[OF]
        R[OF] 0
        RC[OD] D
        Q R[OE]
        ALU_Q-D,CLK.UBCC
        Z?
=0      J/LEDGE4           ; A UTRAP OCCURRED.
        J/LEDGE7           ; NO UTRAP OCCURRED.
LEDGE4: ALU_D[AND]K[.4],CLK.UBCC
        Z?
=0      J/LEDGED           ; A NON XPAGE TRAP OCCURRED.
        ERROR1             ; A XPAGE TRAP OCCURRED.
LEDGED: ALU_D[AND]K[.2],CLK.UBCC
        Z?
=0      ERROR1             ; A NON ALIGNMENT UTRAP OCCURRED.
        J/LEDGE7           ; AN ALIGN UTRAP OCCURRED.
LEDGE5: LAB R[OE]
        R[OF] LA
        DT/LONG,FS/MCT,MCT/READ.V.WCHK           ; SHOULD TRAP.
        D R[OF]
        R[OF] 0
        RC[OD] D
        Q R[OE]
        ALU_Q-D,CLK.UBCC
        Z?
=0      J/LEDGE6           ; A UTRAP OCCURRED
        ERROR1             ; NO UTRAP OCCURRED.
LEDGE6: ALU_D[AND]K[.4],CLK.UBCC
        Z?
=0      ERROR1             ; A NON XPAGE UTRAP OCCURRED
        NOP                ; OK
LEDGE7: ALU_R[O],CLK.UBCC
        Z?
=0      R[O]_LA-K[.1],J/LEDGE1
        NOP

```

[illegible]

```

:2545 .PAGE 'TEST AE CROSS PAGE UTRAP USING DT/WORD TEST'
:2546 *****
:2547 ++
:2548 TEST AE CROSS PAGE USING DT/WORD TEST
:2549
:2550 TEST DESCRIPTION
:2551 THIS IS A TEST OF THE CROSS PAGE ERROR DETECTION LOGIC
:2552 IN THE TB USING DT=WORD.
:2553
:2554 ERROR DESCRIPTION
:2555 VA USED IN TEST
:2556 UTRAP FLAG
:2557 FLAG UTRAP TYPE
:2558 -----
:2559 DE NO UTRAP OCCURRED
:2560 SE TB PARITY ERROR
:2561 9E TB MISS
:2562 CE TB PROTECTION ERROR
:2563 D6 TB MODIFY BIT ERROR
:2564 DA X PAGE UTRAP
:2565 DC UNALIGNED DATA UTRAP
:2566
:2567 --
:2568 *****
:2569
:2570 =0
:2571 WEDGE: NEWTST
:2572 RC[0F],K[.2]
:2573 =0 CALL,J7TBWPTP
:2574 D,K[.3FF]
:2575 D-D.RIGHT,SI/ZERO
:2576 R[1] D
:2577 Q RC[1]
:2578 ALU,Q[OR]D,R[3],ALU
:2579 R[0],K[.9]
:2580 =0 CALL,J/C5OFF
:2581 VA_RC[1]
:2582 LC_RC[0]
:2583 =0 R[8],LC,CALL,J/TBWRB
:2584 D 0
:2585 =0 CALL,J/DC.DE
:2586 R[0E] D
:2587 =0 ERLOOP
:2588 WEDGE1: SC R[0]
:2589 D R[3]
:2590 ALU,D,AND,MASK,D_ALU,VA_ALU,R[0E],ALU
:2591 Q R[1]
:2592 ALU,Q[ANDNOT]D,CLK.UBCC
:2593 Z?
:2594 =0 J/WEDGE3 ; EXPECT NO TRAP
:2595 J/WEDGE5 ; EXPECT A TRAP
:2596 WEDGE3: LAB R[0E]
:2597 R[0F] LA
:2598 DT/WORD,FS/MCT,MCT/READ.V.WCHK ; SHOULDN'T TRAP.
:2599 D R[0F]
:2600 R[0F] 0

```


:Lo

[illegible]

```

:2633
:2634
:2635
:2636
:2637
:2638
:2639
:2640
:2641
:2642
:2643
:2644
:2645
:2646
:2647
:2648
:2649
:2650
:2651
:2652
:2653
:2654
:2655
:2656
U 1152, 0000,003D,0180,0800,0000,11CC
U 1153, 0000,003C,0180,0800,0000,1156
U 1156, 0000,003D,0180,0800,0000,11E9
U 1157, 0F00,003C,0180,0800,0000,1158
U 1158, 0000,003D,0180,0800,0000,1034
U 1159, 0001,003C,0180,0AF0,0000,115A
U 115A, 0000,003D,0180,0800,0000,11DF
U 115B, 0F00,003C,0180,0800,0000,1301
U 1301, 0000,003C,4980,3C00,0000,1302
U 1302, 0018,0038,8180,0800,0200,1303
U 1303, 0000,003C,0180,0A70,0000,1304
U 1304, 0000,003C,0180,0AF8,0000,1305
U 1305, 0000,003C,0180,5000,0000,1306
U 1306, 0800,003C,0180,0A78,0000,1307
U 1307, 0003,003C,0180,0AF8,0000,1308
U 1308, 0018,0038,0580,09F8,0000,1309
U 1309, 0001,003C,0180,09F0,0000,130A
U 130A, 0000,003C,01C0,0A70,0000,130B
U 130B, 001D,2000,0180,0800,0010,130C
U 130C, 0000,013C,0180,0800,0000,115C
U 115C, 0000,003C,0180,0800,0000,130D
U 115D, 0000,003C,0180,0800,0000,1161
U 130D, 0019,0034,1180,0800,0010,130E
U 130E, 0000,013C,0180,0800,0000,115E
U 115E, 0000,003C,0180,0800,0000,130F
U 115F, 0000,003D,0180,0800,0000,11E0
U 130F, 0019,0034,0580,0800,0010,1310
U 1310, 0000,013C,0180,0800,0000,1160
U 1160, 0000,003D,0180,0800,0000,11E0
U 1161, 0000,003C,0180,0800,0000,1162

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```

.PAGE "TEST AF CROSS PAGE UTRAP ENABLE TEST"
*****
++
TEST AF CROSS PAGE UTRAP ENABLE TEST

TEST DESCRIPTION
THIS TEST INSURES THAT DEASSERTING MME (TBERO <0>)
INHIBITS XPAGE TRAPS.

ERROR DESCRIPTION
UTRAP FLAG
FLAG UTRAP TYPE
-----
DE NO UTRAP OCCURRED
5E TB PARITY ERROR
9E TB MISS
CE TB PROTECTION ERROR
D6 TB MODIFY BIT ERROR
DA X PAGE UTRAP
DC UNALIGNED DATA UTRAP
-----

=0
NEDGE: NEWTST
NOP
=0 CALL,J/CSOFF
D 0
=0 CALL,J/DC.DE
R[OE] D
=0 ERLOOP
D 0
ID[TBERO] D
VA K[.3FF]
LAB R[OE]
R[OF] LA
DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULDN'T TRAP.
D R[OF]
R[OF] 0
R[OF]_K[.1]
R[OE] D
Q R[OE]
A[U_Q-D,CLK.UBCC
Z?
=0 J/NEDGE1
J/NEDGE2
NEDGE1: ALU_D[AND]K[.4],CLK.UBCC
Z?
=0 J/NEDGE3
ERROR1 ; A NON XPAGE TRAP OCCURRED.
; A XPAGE UTRAP OCCURRED.
NEDGE3: ALU_D[AND]K[.1],CLK.UBCC
Z?
=0 ERROR1 ; THE UTRAP WAS NOT AN ALIGNMENT
; OR XPAGE ERROR
NEDGE2: NOP

```

```

:2688 .PAGE "TEST B0 TB PROTECTION LOGIC TEST"
:2689 *****
:2690 **
:2691 TEST B0 TB PROTECTION LOGIC TEST
:2692
:2693 TEST DESCRIPTION
:2694 THIS IS A TEST OF THE ACCESS PROTECT LOGIC. ONE
:2695 LOCATION IN THE TB (OF EACH GROUP) IS USED TO TEST THE
:2696 PROTECT LOGIC'S RESPONSE TO EVERY POSSIBLE ACCESS CODE
:2697 WITH EVERY PROCESSOR MODE (PSL<25:24>).
:2698 NOTE THAT SUBTEST 1 TESTS GROUP 0.
:2699 SUBTEST 2 TESTS GROUP 1.
:2700
:2701 ERROR DESCRIPTION
:2702 PTE BEING USED
:2703 PSL (ONLY THE CURRENT MODE BITS ARE RELEVANT)
:2704 UTRAP FLAG
:2705 FLAG UTRAP TYPE
:2706 ----
:2707 DE NO UTRAP OCCURRED
:2708 SE TB PARITY ERROR
:2709 9E TB MISS
:2710 CE TB PROTECTION ERROR
:2711 D6 TB MODIFY BIT ERROR
:2712 DA X PAGE UTRAP
:2713 DC UNALIGNED DATA UTRAP
:2714
:2715 VA
:2716 ERROR CODE A:
:2717 0=> NO UTRAP EXPECTED
:2718 1=> UTRAP EXPECTED
:2719
:2720 ERROR CODE B:
:2721 0=> FIRST TRAP ATTEMPT COMPLETE (WANTED ONE AND GOT ONE)
:2722 1=> FIRST TRAP ATTEMPT NOT COMPLETE
:2723
:2724 --
:2725 *****
:2726 =0
:2727 PROTEST: NEWTST
:2728 NOP
:2729 =0 CALL J/CSOFF ; R[2]=PROTECTION CODE
:2730 =0 CALL J/TBWPTP ; R[3]_PSL MODE
:2731 R[3]_0
:2732 R[1]_KE.3F]
:2733 =0 D 0,CALL J/DCF
:2734 SC K[.1B],Q_0
:2735 D BAL.SC
:2736 =0 ALU NOT.D,R[4] ALU ; R[4]=PTE MASK=87FFFFFF
:2737 D 0,CALL J/DC.DE
:2738 R[OE] D
:2739 RC[OF] K[.6]
:2740 RC[9] R[.1] ; TRAP NOT YET TRIED FLAG
:2741 =0 SUBTEST
:2742 NOP

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U 1162, 0000,003D,0180,0800,0000,11CC
U 1163, 0000,003C,0180,0800,0000,1164
U 1164, 0000,003D,0180,0800,0000,11E9
U 1165, 0003,003C,0180,0A90,0000,1166
U 1166, 0000,003D,0180,0800,0000,1243
U 1167, 0003,003C,0180,0A98,0000,1311
U 1311, 0018,0038,5580,0A88,0000,1168
U 1168, 0F00,003D,0180,0800,0000,123A
U 1169, 0000,003C,EDF8,0800,0084,7312
U 1312, 0D00,003C,0180,0800,0000,1313
U 1313, 0001,0028,0180,0AA0,0000,116A
U 116A, 0F00,003D,0180,0800,0000,1034
U 116B, 0001,003C,0180,0AF0,0000,1314
U 1314, 0018,0038,D580,09F8,0000,1315
U 1315, 0018,0038,0580,09C8,0000,116C
U 116C, 0000,003D,0180,0800,0000,11E4
U 116D, 0000,003C,0180,0800,0000,116E

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U 116E, 0000,003D,0180,0800,0000,11DF :2743 =0 ERLOOP
U 116F, 0010,0038,0180,0908,0200,1316 :2744 PROT1: VA_RC[1]
U 1316, 0000,003C,0180,0900,0000,1170 :2745 LC_RC[0]
U 1170, 0010,0039,0180,0AC0,0000,107A :2746 =0 R[8] LC, CALL, J/TBWRB
U 1171, 0800,003C,01F8,0A18,0000,1317 :2747 D_R[3], Q 0
U 1317, 0000,003C,7D80,0800,0084,7318 :2748 SC_K[.18]
U 1318, 0D00,003C,0180,0800,0000,1319 :2749 D_BAL, SC
U 1319, 0001,003C,0180,09E8,0000,131A :2750 RC[0D] D
U 131A, 0000,003C,3D80,3C00,0000,131B :2751 ID[PSL] D ; SET PSL<25:24>=MODE
U 131B, 0010,0038,0180,0920,0200,131C :2752 VA_RC[4]
U 131C, 0010,0038,0180,09D8,0000,131D :2753 RC[0B] LC
U 131D, 0800,003C,0180,0A10,0000,131E :2754 D_R[2]
U 131E, 0000,003C,EDF8,0800,0084,731F :2755 SC_K[.1B], Q 0
U 131F, 0D00,003C,0180,0A20,0000,1320 :2756 D_BAL, SC, LAB_R[4]
U 1320, 0010,0034,01C0,0918,0000,1321 :2757 LC_RC[3], ALU_LA[AND]LC, Q ALU
U 1321, 081D,2030,0180,09F0,0000,1172 :2758 ALU_Q[OR]D, RC[0E] ALU, D_ALU
U 1172, 0001,003D,0180,0AC0,0000,1078 :2759 =0 R[8] D, CALL, J/TBWRO
U 1173, 0000,003C,0180,0A18,0000,1322 :2760 LAB_R[3]
U 1322, 0000,003C,0180,09E0,0000,1323 :2761 RC[0C] LA
U 1323, 0000,003C,0180,0A10,0000,1324 :2762 LAB_R[2]
U 1324, 0000,003C,0180,09D8,0000,1325 :2763 RC[0B] LA
U 1325, 0003,003C,0180,09D0,0000,1326 :2764 RC[0A] 0
U 1326, 0800,003C,0180,0A10,0000,1174 :2765 D_R[2]
U 1174, 0800,193D,0180,0A18,0000,1020 :2766 =0 D-R[3], D3-0?, CALL, J/PRT1
U 1175, 0000,003C,0180,0A18,0000,1327 :2767 LAB_R[3]
U 1327, 0018,0000,0D80,0800,0010,1328 :2768 ALU_LA[A-B]K[.3], CLK.UBCC
U 1328, 0000,013C,0180,0800,0000,1176 :2769 Z?
U 1176, 0018,0014,0580,0A98,0000,132B :2770 =0 R[3] LA+K[.1], J/PROT2
U 1177, 0003,003C,0180,0A98,0000,1329 :2771 R[3] 0
U 1329, 0000,003C,0180,0A10,0000,132A :2772 LAB_R[2]
U 132A, 0018,0014,0580,0A90,0000,132B :2773 R[2] LA+K[.1]
U 132B, 0000,003C,0180,0A08,0010,132C :2774 PROT2: ALU_R[1], CLK.UBCC
U 132C, 0000,013C,0180,0800,0000,1178 :2775 Z?
U 1178, 0018,0000,0580,0A88,0000,116F :2776 =0 R[1] LA-K[.1], J/PROT1
U 1179, 0010,0038,0180,0908,0200,132D :2777 VA_RC[1]
U 132D, 0010,0038,0180,09D0,0000,132E :2778 RC[0A] LC
U 132E, 0000,003C,0180,0910,0000,1008 :2779 LC_RC[2]
U 1008, 0010,0039,0180,0A88,0000,1226 :2780 =000 R[7] LC, CALL, J/HIT1
U 1009, 0000,003D,0180,0800,0000,11E0 :2781 ERROR1
U 100A, 0000,003D,0180,0800,0000,11E0 :2782 ERROR1
U 100B, 0000,003D,0180,0800,0000,11E0 :2783 ERROR1
U 100C, 0000,003D,0180,0800,0000,11F9 :2784 CALL, J/RELCHK
U 100D, 0000,003D,0180,0800,0000,11E0 :2785 ERROR1
U 100E, 0000,003D,0180,0800,0000,11E0 :2786 ERROR1
U 100F, 0000,003C,0180,0800,0000,117A :2787 NOP
U 117A, 0000,003D,0180,0800,0000,11E4 :2788 =0 SUBTEST
U 117B, 0018,0038,5580,0A88,0000,132F :2789 R[1] K[.3F]
U 132F, 0003,003C,0180,0A90,0000,1330 :2790 R[2] 0
U 1330, 0003,003C,0180,0A98,0000,1180 :2791 R[3] 0
U 1180, 0000,003D,0180,0800,0000,11DF :2792 =0 ERLOOP
U 1181, 0010,0038,0180,0938,0200,1331 :2793 PROT3: VA_RC[7]
U 1331, 0000,003C,0180,0930,0000,1182 :2794 LC_RC[6]
U 1182, 0010,0039,0180,0AC0,0000,107A :2795 =0 R[8] LC, CALL, J/TBWRB
U 1183, 0800,003C,01F8,0A18,0000,1332 :2796 D_R[3], Q 0
U 1332, 0000,003C,7D80,0800,0084,7333 :2797 SC_K[.18]

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U 1333, 0000,003C,0180,0800,0000,1334 :2798
U 1334, 0001,003C,0180,09E8,0000,1335 :2799
U 1335, 0000,003C,3D80,3C00,0000,1336 :2800
U 1336, 0010,0038,0180,0908,0200,1337 :2801
U 1337, 0010,0038,0180,09D8,0000,1338 :2802
U 1338, 0800,003C,0180,0A10,0000,1339 :2803
U 1339, 0000,003C,EDF8,0800,0084,733A :2804
U 133A, 0D00,003C,0180,0A20,0000,133B :2805
U 133B, 0010,0034,01C0,0900,0000,133C :2806
U 133C, 081D,2030,0180,09F0,0000,1184 :2807
U 1184, 0001,003D,0180,0AC0,0000,104C :2808
U 1185, 0000,003C,0180,0A18,0000,133D :2809
U 133D, 0000,003C,0180,09E0,0000,133E :2810
U 133E, 0000,003C,0180,0A10,0000,133F :2811
U 133F, 0000,003C,0180,09D8,0000,1340 :2812
U 1340, 0018,0038,0580,09D0,0000,1341 :2813
U 1341, 0800,003C,0180,0A10,0000,1186 :2814
U 1186, 0800,193D,0180,0A18,0000,1020 :2815
U 1187, 0000,003C,0180,0A18,0000,1342 :2816
U 1342, 0018,0000,0D80,0800,0010,1343 :2817
U 1343, 0000,013C,0180,0800,0000,1188 :2818
U 1188, 0018,0014,0580,0A98,0000,1346 :2819
U 1189, 0003,003C,0180,0A98,0000,1344 :2820
U 1344, 0000,003C,0180,0A10,0000,1345 :2821
U 1345, 0018,0014,0580,0A90,0000,1346 :2822
U 1346, 0000,003C,0180,0A08,0010,1347 :2823
U 1347, 0000,013C,0180,0800,0000,118A :2824
U 118A, 0018,0000,0580,0A88,0000,1181 :2825
U 118B, 0010,0038,0180,0938,0200,1348 :2826
U 1348, 0010,0038,0180,09D0,0000,1349 :2827
U 1349, 0000,003C,0180,0940,0000,1040 :2828
U 1040, 0010,0039,0180,0AB8,0000,1219 :2829
U 1041, 0000,003D,0180,0800,0000,11E0 :2830
U 1042, 0000,003D,0180,0800,0000,11E0 :2831
U 1043, 0000,003D,0180,0800,0000,11E0 :2832
U 1044, 0000,003D,0180,0800,0000,11F9 :2833
U 1045, 0000,003D,0180,0800,0000,11E0 :2834
U 1046, 0000,003D,0180,0800,0000,11E0 :2835
U 1047, 0000,003C,0180,0800,0000,134A :2836
U 134A, 0000,003C,0180,0800,0000,139B :2837

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D DAL,SC
RC[0D] D
ID[PSL] D
VA RC[1]
RC[0B] LC
D RC[2]
SC K[.1B],0 0
D DAL,SC,LAB RC[4]
LC RC[0],ALU_LA[AND]LC,0 ALU
ALU Q[OR]D,RC[0E] ALU,D_XLU
R[8] D,CALL,J/TBWR1
LAB RC[3]
RC[0C] LA
LAB RC[2]
RC[0B] LA
RC[0A] K[.1]
D RC[2]
D RC[3],D3-0?,CALL,J/PRT1
LAB RC[3]
ALU_LA[A-B]K[.3],CLK.UBCC
Z?
R[3] LA+K[.1],J/PROT4
R[3] 0
LAB RC[2]
R[2] LA+K[.1]
PROT4: ALU_R[1],CLK.UBCC
Z?
R[1] LA-K[.1],J/PROT3
VA RC[7]
RC[0A] LC
LC RC[8]
R[7] LC,CALL,J/HITO
=000
ERROR1
ERROR1
ERROR1
CALL,J/RELCHK
ERROR1
ERROR1
NOP
J/PROTDN
; THIS SUBROUTINE IS USED TO CHECK MODE VS. ACCESS CODE COMBINATIONS
; WHICH ALLOW ACCESS FOR BOTH READS AND WRITES.
PROTC1: LAB RC[0E]
RC[0A] 0 : NO TRAP EXPECTED FLAG
R[0F] [A,MCT/READ.V.RCHK
D R[0F]
R[0F] 0
LAB RC[0E]
RC[0C] D
ALU_LA[A-B]D,CLK.UBCC
Z?
=0
J/PROTC2
J/PROTC3
PROTC2: ALU_D[AND]K[.10],CLK.UBCC
Z?
; UTRAP OCCURRED.
; NO UTRAP

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U 118E, 0000,003D,0180,0800,0000,11E0 :2853 =0 ERROR1 ; A UTRAP WHICH WAS NOT AN
:2854 ; ACCESS VIOLATION OCCURRED.
U 118F, 0000,003D,0180,0800,0000,11E0 :2855 ERROR1 ; AN ACCESS VIOLATION MICRO TRAP
:2856 ; OCCURRED.
U 1356, 0000,003C,0180,0000,0000,1357 :2857 PROTC3: FS/MCT,MCT/TEST.RCHK
U 1357, 0000,1D3C,0180,0800,0000,107C :2858 BEN/TB.TEST
U 107C, 0000,003C,0180,0800,0000,1358 :2859 =11100 J/PRTC3
U 107D, 0000,003D,0180,0800,0000,11E0 :2860 ERROR1
U 107E, 0000,003D,0180,0800,0000,11E0 :2861 ERROR1
U 107F, 0000,003D,0180,0800,0000,11E0 :2862 ERROR1
U 1358, 0000,003C,0180,0A70,0000,1359 :2863 PRTC3: LAB R[OE]
U 1359, 0000,003C,0180,52F8,0000,135A :2864 R[OF] LA,MCT/READ.V.WCHK
U 135A, 0800,003C,0180,0A78,0000,135B :2865 D R[OF]
U 135B, 0003,003C,0180,0AF8,0000,135C :2866 R[OF] 0
U 135C, 0000,003C,0180,0A70,0000,135D :2867 LAB R[OE]
U 135D, 0001,003C,0180,09E0,0000,135E :2868 R[OC] D
U 135E, 001C,2000,0180,0800,0010,135F :2869 ALU_LA[A-B]D,CLK.UBCC
U 135F, 0000,013C,0180,C800,0000,1190 :2870 Z?
U 1190, 0000,003C,0180,0800,0000,1360 :2871 =0 J/PRTC4 ; A LTRAP OCCURRED.
U 1191, 0000,003C,0180,0800,0000,1362 :2872 J/PRTC5 ; NO UTRAP OCCURRED
U 1360, 0019,0034,6580,0800,0010,1361 :2873 PROTC4: ALU_D[AND]K[.10],CLK.UBCC
U 1361, 0000,013C,0180,0800,0000,1192 :2874 Z?
U 1192, 0000,003D,0180,0800,0000,11E0 :2875 =0 ERROR1 ; A NON TB ACCESS VIOLATION
:2876 ; UTRAP OCCURRED.
U 1193, 0000,003D,0180,0800,0000,11E0 :2877 ERROR1 ; A TB ACCESS VIOLATION
:2878 ; UTRAP OCCURRED.
U 1362, 0000,003C,0180,1000,0000,1363 :2879 PROTC5: FS/MCT,MCT/TEST.WCHK
U 1363, 0000,1D3C,0180,0800,0000,109C :2880 BEN/TB.TEST
U 109C, 0000,003C,0180,0800,0000,1364 :2881 =11100 J/PRTC5
U 109D, 0000,003D,0180,0800,0000,11E0 :2882 ERROR1
U 109E, 0000,003D,0180,0800,0000,11E0 :2883 ERROR1
U 109F, 0000,003D,0180,0800,0000,11E0 :2884 ERROR1
U 1364, 0000,003E,0180,0800,0000,0001 :2885 PRTC5: RETURN1
:2886 ; THIS IS A SUBROUTINE USED TO TEST MODE VS ACCESS CODE COMBINATIONS
:2887 ; WHICH ALLOW READS BUT PROHIBIT WRITES.
U 1365, 0000,003C,0180,0A70,0000,1366 :2888 PROTC6: LAB R[OE]
U 1366, 0003,003C,0180,09D0,0000,1367 :2889 R[OA] 0 ; NO TRAP EXPECTED FLAG
U 1367, 0000,003C,0180,42F8,0000,1368 :2890 R[OF] LA,MCT/READ.V.RCHK
U 1368, 0800,003C,0180,0A78,0000,1369 :2891 D R[OF]
U 1369, 0003,003C,0180,0AF8,0000,136A :2892 R[OF] 0
U 136A, 0000,003C,0180,0A70,0000,136B :2893 LAB R[OE]
U 136B, 0001,003C,0180,09E0,0000,136C :2894 R[OC] D
U 136C, 001C,2000,0180,0800,0010,136D :2895 ALU_LA[A-B]D,CLK.UBCC
U 136D, 0000,013C,0180,0800,0000,1194 :2896 Z?
U 1194, 0000,003C,0180,0800,0000,136E :2897 =0 J/PRTC7 ; UTRAP OCCURRED.
U 1195, 0000,003C,0180,0800,0000,1370 :2898 J/PRTC8 ; NO UTRAP
U 136E, 0019,0034,6580,0800,0010,136F :2899 PROTC7: ALU_D[AND]K[.10],CLK.UBCC
U 136F, 0000,013C,0180,0800,0000,1196 :2900 Z?
U 1196, 0000,003D,0180,0800,0000,11E0 :2901 =0 ERROR1 ; A UTRAP WHICH WAS NOT AN
:2902 ; ACCESS VIOLATION OCCURRED.
U 1197, 0000,003D,0180,0800,0000,11E0 :2903 ERROR1 ; AN ACCESS VIOLATION MICRO TRAP
:2904 ; OCCURRED.
U 1370, 0000,003C,0180,0000,0000,1371 :2905 PROTC8: FS/MCT,MCT/TEST.RCHK
U 1371, 000C,1D3C,0180,0800,0000,10BC :2906 BEN/TB.TEST
U 10BC, 0000,003C,0180,0800,0000,1372 :2907 =11100 J/PRTC8

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U 10BD, 0000,003D,0180,0800,0000,11E0 :2908
U 10BE, 0000,003D,0180,0800,0000,11E0 :2909
U 10BF, 0000,003D,0180,0800,0000,11E0 :2910
U 1372, 0000,003C,0180,0A70,0000,1373 :2911
U 1373, 0018,0038,0580,09D0,0000,1374 :2912
U 1374, 0000,003C,0180,52F8,0000,1375 :2913
U 1375, 0800,003C,0180,0A78,0000,1376 :2914
U 1376, 0003,003C,0180,0AF8,0000,1377 :2915
U 1377, 0000,003C,0180,0A70,0000,1378 :2916
U 1378, 0001,003C,0180,09E0,0000,1379 :2917
U 1379, 001C,2000,0180,0800,0010,137A :2918
U 137A, 0000,013C,0180,0800,0000,1198 :2919
U 1198, 0000,003C,0180,0800,0000,137B :2920
U 1199, 0000,003D,0180,0800,0000,11E0 :2921
U 137B, 0019,0034,6580,0800,0010,137C :2922
U 137C, 0000,013C,0180,0800,0000,119A :2923
U 119A, 0000,003D,0180,0800,0000,11E0 :2924
:2925
U 119B, 0000,003C,0180,0800,0000,137D :2926
:2927
U 137D, 0000,003C,0180,1000,0000,137E :2928
U 137E, 0000,1D3C,0180,0800,0000,10DC :2929
U 10DC, 0000,003D,0180,0800,0000,11E0 :2930
U 10DD, 0000,003D,0180,0800,0000,11E0 :2931
U 10DE, 0000,003C,0180,0800,0000,137F :2932
U 10DF, 0000,003D,0180,0800,0000,11E0 :2933
U 137F, 0000,003E,0180,0800,0000,0001 :2934
:2935
:2936
U 1380, 0000,003C,0180,0A70,0000,1381 :2937
U 1381, 0018,0038,0580,09D0,0000,1382 :2938
U 1382, 0000,003C,0180,42F8,0000,1383 :2939
U 1383, 0800,003C,0180,0A78,0000,1384 :2940
U 1384, 0003,003C,0180,0AF8,0000,1385 :2941
U 1385, 0000,003C,0180,0A70,0000,1386 :2942
U 1386, 0001,003C,0180,09E0,0000,1387 :2943
U 1387, 001C,2000,0180,0800,0010,1388 :2944
U 1388, 0000,013C,0180,0800,0000,119C :2945
U 119C, 0000,003C,0180,0800,0000,1389 :2946
U 119D, 0000,003D,0180,0800,0000,11E0 :2947
U 1389, 0019,0034,6580,0800,0010,138A :2948
U 138A, 0000,013C,0180,0800,0000,119E :2949
U 119E, 0000,003D,0180,0800,0000,11E0 :2950
:2951
U 119F, 0000,003C,0180,0800,0000,138B :2952
:2953
U 138B, 0000,003C,0180,0000,0000,138C :2954
U 138C, 0000,1D3C,0180,0800,0000,10FC :2955
U 10FC, 0000,003D,0180,0800,0000,11E0 :2956
U 10FD, 0000,003D,0180,0800,0000,11E0 :2957
U 10FE, 0000,003C,0180,0800,0000,138D :2958
U 10FF, 0000,003D,0180,0800,0000,11E0 :2959
U 138D, 0000,003C,0180,0A70,0000,138E :2960
U 138E, 0003,003C,0180,09C8,0000,138F :2961
U 138F, 0000,003C,0180,52F8,0000,1390 :2962

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ERROR1
ERROR1
ERROR1
PRTC8: LAB R[OE]
RC[OA] K[.1] ; TRAP EXPECTED FLAG
R[OF] [A,MCT/READ.V.WCHK
D R[OF]
R[OF] 0
LAB R[OE]
RC[OC] 0
ALU_LATA-B]D,CLK.UBCC
Z?
=0 J/PRTC9 ; A UTRAP OCCURRED.
ERROR1 ; NO UTRAP OCCURRED
PRTC9: ALU_D[AND]K[.10],CLK.UBCC
Z?
=0 ERROR1 ; A NON TB ACCESS VIOLATION
; UTRAP OCCURRED.
; A TB ACCESS VIOLATION
; UTRAP OCCURRED.
PRTC10: FS/MCT,MCT/TEST.WCHK
BEN/TB.TEST
=11100 ERROR1
ERROR1
J/PRTC10
PRTC10: RETURN1
; THIS IS A SUBROUTINE WHICH IS USED TO TEST MODE VS ACCESS CODE
; COMBINATIONS WHICH PROHIBIT BOTH READS AND WRITES.
PRTC11: LAB R[OE]
RC[OA] K[.1] ; TRAP EXPECTED FLAG
R[OF] [A,MCT/READ.V.RCHK
D R[OF]
R[OF] 0
LAB R[OE]
RC[OC] 0
ALU_LATA-B]D,CLK.UBCC
Z?
=0 J/PRTC12 ; UTRAP OCCURRED.
ERROR1 ; NO UTRAP
PRTC12: ALU_D[AND]K[.10],CLK.UBCC
Z?
=0 ERROR1 ; A UTRAP WHICH WAS NOT AN
; ACCESS VIOLATION OCCURRED.
; AN ACCESS VIOLATION MICRO TRAP
; OCCURRED.
PRTC13: FS/MCT,MCT/TEST.RCHK
BEN/TB.TEST
=11100 ERROR1
ERROR1
J/PRTC13
PRTC13: LAB R[OE]
RC[OA] 0 ; FIRST TRAP ATTEMPT TRIED AND SUCCEEDED
R[OF] LA,MCT/READ.V.WCHK

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U 1390. 0800.003C.0180.0A78.0000.1391 :2963 D R[OF]
U 1391. 0003.003C.0180.0AF8.0000.1392 :2964 R[OF] 0
U 1392. 0000.003C.0180.0A70.0000.1393 :2965 LAB R[OE]
U 1393. 0001.003C.0180.09E0.0000.1394 :2966 RC[OC] D
U 1394. 001C.2000.0180.0800.0010.1395 :2967 ALU_LA[A-B]D,CLK.UBCC
U 1395. 0000.013C.0180.0800.0000.11A0 :2968 Z?
U 11A0. 0000.003C.0180.0800.0000.1396 :2969 =0 J/PROTC14 ; A UTRAP OCCURRED.
U 11A1. 0000.003D.0180.0800.0000.11E0 :2970 ERROR1 ; NO UTRAP OCCURRED
U 1396. 0019.0034.6580.0800.0010.1397 :2971 PROTC14: ALU_D[AND]K[.10],CLK.UBCC
U 1397. 0000.013C.0180.0800.0000.11A2 :2972 Z?
U 11A2. 0000.003D.0180.0800.0000.11E0 :2973 =0 ERROR1 ; A NON TB ACCESS VIOLATION
:2974 ; UTRAP OCCURRED.
U 11A3. 0000.003C.0180.0800.0000.1398 :2975 NOP ; A TB ACCESS VIOLATION
:2976 ; UTRAP OCCURRED.
U 1398. 0000.003C.0180.1000.0000.1399 :2977 PROTC15: FS/MCT,MCT/TEST.WCHK
U 1399. 0000.1D3C.0180.0800.0000.111C :2978 BEN/TB.TEST
U 111C. 0000.003D.0180.0800.0000.11E0 :2979 =11100 ERROR1
U 111D. 0000.003D.0180.0800.0000.11E0 :2980 ERROR1
U 111E. 0000.003C.0180.0800.0000.139A :2981 J/PRTC15
U 111F. 0000.003D.0180.0800.0000.11E0 :2982 ERROR1
U 139A. 0000.003E.0180.0800.0000.0C01 :2983 PRTC15: RETURN1
:2984 =0000
:2985 PRT1: J/PROTC11 ; PROT CODE=0
U 1020. 0000.003C.0180.0800.0000.1380 :2986 RETURN1 ; =1
U 1021. 0000.003E.0180.0800.0000.0001 :2987 J/PRTBA,D3-0? ; =2
U 1022. 0000.193C.0180.0800.0000.1004 :2988 J/PRTBB,D3-0? ; =3
U 1023. 0000.193C.0180.0800.0000.1010 :2989 J/PROTC1 ; =4
U 1024. 0000.003C.0180.0800.0000.134B :2990 J/PRTBC,D3-0? ; =5
U 1025. 0000.193C.0180.0800.0000.1018 :2991 J/PRTBD,D3-0? ; =6
U 1026. 0000.193C.0180.0800.0000.1030 :2992 J/PRTBE,D3-0? ; =7
U 1027. 0000.193C.0180.0800.0000.1038 :2993 J/PRTBF,D3-0? ; =8
U 1028. 0000.193C.0180.0800.0000.1048 :2994 J/PRTBG,D3-0? ; =9
U 1029. 0000.193C.0180.0800.0000.1060 :2995 J/PRTBH,D3-0? ; =A
U 102A. 0000.193C.0180.0800.0000.1064 :2996 J/PRTBI,D3-0? ; =B
U 102B. 0000.193C.0180.0800.0000.1068 :2997 J/PRTBJ,D3-0? ; =C
U 102C. 0000.193C.0180.0800.0000.106C :2998 J/PRTBK,D3-0? ; =D
U 102D. 0000.193C.0180.0800.0000.1070 :2999 J/PRTBL,D3-0? ; =E
U 102E. 0000.193C.0180.0800.0000.1074 :3000 J/PROTC6 ; =F
U 102F. 0000.003C.0180.0800.0000.1365 :3001 =00
:3002 PRTBA: J/PROTC1
U 1004. 0000.003C.0180.0800.0000.134B :3003 J/PROTC11
U 1005. 0000.003C.0180.0800.0000.1380 :3004 J/PROTC11
U 1006. 0000.003C.0180.0800.0000.1380 :3005 J/PROTC11
U 1007. 0000.003C.0180.0800.0000.1380 :3006 =00
:3007 PRTBB: J/PROTC6
U 1010. 0000.003C.0180.0800.0000.1365 :3008 J/PROTC11
U 1011. 0000.003C.0180.0800.0000.1380 :3009 J/PROTC11
U 1012. 0000.003C.0180.0800.0000.1380 :3010 J/PROTC11
U 1013. 0000.003C.0180.0800.0000.1380 :3011 =00
:3012 PRTBC: J/PROTC1
U 1018. 0000.003C.0180.0800.0000.134B :3013 J/PROTC1
U 1019. 0000.003C.0180.0800.0000.134B :3014 J/PROTC11
U 101A. 0000.003C.0180.0800.0000.1380 :3015 J/PROTC11
U 101B. 0000.003C.0180.0800.0000.1380 :3016 =00
:3017 PRTBD: J/PROTC1
U 1030. 0000.003C.0180.0800.0000.134B :3017

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PROT CODE=0
=1
=2
=3
=4
=5
=6
=7
=8
=9
=A
=B
=C
=D
=E
=F

[illegible]

ESKAH29.MCR

TEST BO

TB PROTECTION

LOGIC TEST

MICRO2 1M(01)

16-DEC-82 11:10:00

SEQ 0460
Page 7

ZZ
ES

U	1031.	0000.003C.0180.0800.0000.1365	:3018	J/PROTC6
U	1032.	0000.003C.0180.0800.0000.1380	:3019	J/PROTC11
U	1033.	0000.003C.0180.0800.0000.1380	:3020	J/PROTC11
			:3021	=00
U	103B.	0000.003C.0180.0800.0000.1365	:3022	PRTBE: J/PROTC6
U	1039.	0000.003C.0180.0800.0000.1365	:3023	J/PROTC6
U	103A.	0000.003C.0180.0800.0000.1380	:3024	J/PROTC11
U	103B.	0000.003C.0180.0800.0000.1380	:3025	J/PROTC1
			:3026	=00
U	1048.	0000.003C.0180.0800.0000.134B	:3027	PRTBF: J/PROTC1
U	1049.	0000.003C.0180.0800.0000.134B	:3028	J/PROTC1
U	104A.	0000.003C.0180.0800.0000.134B	:3029	J/PROTC1
U	104B.	0000.003C.0180.0800.0000.1380	:3030	J/PROTC11
			:3031	=00
U	1060.	0000.003C.0180.0800.0000.134B	:3032	PRTBG: J/PROTC1
U	1061.	0000.003C.0180.0800.0000.134B	:3033	J/PROTC1
U	1062.	0000.003C.0180.0800.0000.1365	:3034	J/PROTC6
U	1063.	0000.003C.0180.0800.0000.1380	:3035	J/PROTC11
			:3036	=00
U	1064.	0000.003C.0180.0800.0000.134B	:3037	PRTBH: J/PROTC1
U	1065.	0000.003C.0180.0800.0000.1365	:3038	J/PROTC6
U	1066.	0000.003C.0180.0800.0000.1365	:3039	J/PROTC6
U	1067.	0000.003C.0180.0800.0000.1380	:3040	J/PROTC11
			:3041	=00
U	1068.	0000.003C.0180.0800.0000.1365	:3042	PRTBI: J/PROTC6
U	1069.	0000.003C.0180.0800.0000.1365	:3043	J/PROTC6
U	106A.	0000.003C.0180.0800.0000.1365	:3044	J/PROTC6
U	106B.	0000.003C.0180.0800.0000.1380	:3045	J/PROTC11
			:3046	=00
U	106C.	0000.003C.0180.0800.0000.134B	:3047	PRTBJ: J/PROTC1
U	106D.	0000.003C.0180.0800.0000.134B	:3048	J/PROTC1
U	106E.	0000.003C.0180.0800.0000.134B	:3049	J/PROTC1
U	106F.	0000.003C.0180.0800.0000.1365	:3050	J/PROTC6
			:3051	=00
U	1070.	0000.003C.0180.0800.0000.134B	:3052	PRTBK: J/PROTC1
U	1071.	0000.003C.0180.0800.0000.134B	:3053	J/PROTC1
U	1072.	0000.003C.0180.0800.0000.1365	:3054	J/PROTC6
U	1073.	0000.003C.0180.0800.0000.1365	:3055	J/PROTC6
			:3056	=00
U	1074.	0000.003C.0180.0800.0000.134B	:3057	PRTBL: J/PROTC1
U	1075.	0000.003C.0180.0800.0000.1365	:3058	J/PROTC6
U	1076.	0000.003C.0180.0800.0000.1365	:3059	J/PROTC6
U	1077.	0000.003C.0180.0800.0000.1365	:3060	J/PROTC6
U	139B.	0000.003C.0180.0800.0000.11A4	:3061	PROTDN: NOP

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:3111
:3112
:3113
:3114
:3115
:3116
U 11A4, 0000,003D,0180,0800,0000,11CC
U 11A5, 0F00,003C,0180,0800,0000,11A6
U 11A6, 0000,003D,4980,3C00,0000,11E9
U 11A7, 081B,0000,0580,0800,0000,139C
U 139C, 0200,003C,0180,0800,0000,139D
U 139D, 0019,0024,0D80,0AC0,0000,139E
U 139E, 0018,0038,ED80,0AA0,0000,139F
U 139F, 0003,003C,0180,0AF8,0000,13A0
U 13A0, 0018,0038,0980,09F8,0000,11A8
U 11A8, 0000,003D,0180,0800,0000,11DF
U 11A9, 0018,0014,0980,0A20,0082,13A1
U 13A1, 0003,001C,0180,09F0,0200,13A2
U 13A2, 0018,0038,1980,6000,0200,13A3
U 13A3, 0000,003C,0180,F800,0000,13A4
U 13A4, 0000,003C,69F0,2C00,0000,13A5
U 13A5, 0000,003C,0188,0800,0000,13A6
U 13A6, 0000,003C,01A8,0800,0000,13A7
U 13A7, 0000,003C,01B0,0800,0000,13A8
U 13A8, 0810,0038,0180,0970,0000,13A9
U 13A9, 0001,203C,0180,09E8,0000,13AA
U 13AA, 001D,200C,0180,0800,0010,13AB
U 13AB, 0000,013C,0180,0800,0000,11AA
U 11AA, 0000,003D,0180,0800,0000,11E0
U 11AB, 0800,003C,0180,0A40,0000,13AC
U 13AC, 0001,0034,0180,09F0,0200,13AD
U 13AD, 0018,0038,1980,6000,0200,13AE
U 13AE, 0000,003C,0180,F800,0000,13AF
U 13AF, 0000,003C,69F0,2C00,0000,13B0
U 13B0, 0000,003C,0188,0800,0000,13B1
U 13B1, 0000,003C,01A8,0800,0000,13B2
U 13B2, 0000,003C,01B0,0800,0000,13B3
U 13B3, 0810,0038,0180,0970,0000,13B4
U 13B4, 0001,203C,0180,09E8,0000,13B5

```

```

.PAGE "TEST B1 IPA REGISTER TEST"
*****
++
TEST B1 IPA REGISTER TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ADDRESS PATH FROM THE VAMX,
THROUGH THE IPA MUX, INTO THE IPA AND FROM THE
IPA THROUGH THE PAMUX ONTO THE PA BUS. THIS IS DONE
BY EXECUTING A READ.V.NEWPC WITH MME DEASSERTED
THEREBY LOADING THE VA INTO THE IPA. THE AN ALLOW
IBUF READ IS EXECUTED AND THE RESULT IS PICKED UP
IN THE TIME OUT ADDRES REGISTER. NOTE THAT THE
IBUF IS STOPPED DURING THE TEST.

ERROR DESCRIPTION
EXPECTED IPA (ADDRESS BITS JUSTIFIED TO THEIR PROPER POSITIONS)
GOT IPA
--
*****
=0
PIBA: NEWTST
D 0
=0 ID[BERO] D,CALL,J/CSOFF
ALU 0-KC.T],D ALU
D D.RIGHT2,S1/ZERO
A[U D[ANDNOT]K[.3],R[8]_ALU
R[4] K[.1B]
R[0F] 0
R[0F]_K[.2]
=0 ERLOOP
PIBA1: LAB_R[4],ALU_LA+K[.2],SC ALU
ALU NOT.MASK,VA ALU,R[0E]_ALU
VA R[ZERO],FS/MCT,MCT/READ.V.NEWPC
FS7MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR]
Q_Q.LEFT2,S1/ZERO
Q_Q.LEFT,S1/ZERO
Q_Q.RIGHT,S1/ZERO
D RC[0E]
R[0D] 0
ALU 0-D,CLK.UBCC
Z?
=0 ERROR1
D R[8]
A[U D.AND.MASK,VA ALU,R[0E]_ALU
VA R[ZERO],FS/MCT,MCT/READ.V.NEWPC
FS7MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR]
Q_Q.LEFT2,S1/ZERO
Q_Q.LEFT,S1/ZERO
Q_Q.RIGHT,S1/ZERO
D RC[0E]
R[0D]_Q

```

C S

SEQ 0462
Page 7

$$= 0$$
$$= 0$$

```

ALU_Q-D,CLK.UBCC
Z?
ERROR1
ALU_R[4],CLK.UBCC
Z?
R[4]_LA-K[.1],J/P/IBA1
NOP

```

22-
ESI[illegible]

```

:3124 .PAGE 'TEST B2 READ.V.NEWPC, HIT IN GROUP 0, TEST'
:3125 *****
:3126 **
:3127 TEST B2 READ.V.NEWPC, HIT IN GROUP 0, TEST
:3128
:3129 TEST DESCRIPTION
:3130 THIS IS A TEST OF A READ.V.NEWPC WITH THE VA
:3131 BEING A HIT IN GROUP 0.
:3132 THIS TESTS THE GROUP ZERO INPUTS TO THE IPA MUX.
:3133
:3134 ERROR DESCRIPTION
:3135 EXPECTED IPA (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER)
:3136 ACTUAL IPA (AS IN TIME OUT ADDRESS REGISTER)
:3137 VA
:3138 PTE WRITTEN INTO GROUP 0
:3139
:3140 --
:3141 *****
:3142 =0
:3143 HOPIBA: NEWTST[.4]
:3144 RCOE]_0
:3145 =0 RCOF]_0,CALL,J/CSOFF
:3146 RCOF]_0
:3147 =0 CALL,J/TBWPTP
:3148 R[4]_K[.14]
:3149 =0 ERLOOP
:3150 HOPIBB: VA_RC[1]
:3151 LC_RC[0]
:3152 =0 R[8]_LC,CALL,J/TBWRB
:3153 SC_R[4]
:3154 Q_R[0C]
:3155 ALU_Q.ORNOT.MASK,Q_ALU
:3156 VA_RC[7]
:3157 RC[0C]_LC
:3158 R[5]_LC
:3159 =0 R[6]_Q,CALL,J/RELSUB
:3160 Q_R[8]
:3161 R[0B]_Q
:3162 =0 R[8]_Q,CALL,J/TBWRO
:3163 FS/MCT,MCT/READ.V.NEWPC
:3164 VA_RC[1]
:3165 FS7MCT,MCT/ALLOW.IB.READ
:3166 Q_ID[TIME.ADDR]
:3167 SC_K[.1B]
:3168 SC-SC+K[.1]
:3169 ALD_MASK+1,D_ALU
:3170 ALU_Q[ANDNOT]D,Q_ALU,RC[0D]_ALU
:3171 D_R[7]
:3172 ALU_Q-D,CLK.UBCC
:3173 RC[0E]_D,Z?
:3174 =0 ERROR1
:3175 VA_RC[7]
:3176 RC[0C]_LC
:3177 SC_R[4]
:3178 Q_R[0D]
  
```

U 11B0, 0018,0039,1180,09F8,0000,11CC
 U 11B1, 0003,003C,0180,0AF0,0000,11B2
 U 11B2, 0003,003D,0180,0AF8,0000,11E9
 U 11B3, 0003,003C,0180,0AF8,0000,11B4
 U 11B4, 0000,003D,0180,0800,0000,1243
 U 11B5, 0018,0038,2180,0AA0,0000,11B6
 U 11B6, 0000,003D,0180,0800,0000,11DF
 U 11B7, 0010,0038,0180,0908,0200,13B8
 U 13B8, 0000,003C,0180,0900,0000,11B8
 U 11B8, 0010,0039,0180,0AC0,0000,107A
 U 11B9, 0000,003C,0180,0A20,0082,13B9
 U 13B9, 0000,003C,01C0,0A60,0000,13BA
 U 13BA, 0001,201C,01C0,0800,0000,13BB
 U 13BB, 0010,0038,0180,0938,0200,13BC
 U 13BC, 0010,0038,0180,09E0,0000,13BD
 U 13BD, 0010,0038,0180,0AA8,0000,11BA
 U 11BA, 0001,203D,0180,0AB0,0000,1080
 U 11BB, 0000,003C,01C0,0A30,0000,13BE
 U 13BE, 0001,203C,0180,09D8,0000,11BC
 U 11BC, 0001,203D,0180,0AC0,0000,1078
 U 11BD, 0000,003C,0180,6000,0000,13BF
 U 13BF, 0010,0038,0180,0908,0200,13C0
 U 13C0, 0000,003C,0180,F800,0000,13C1
 U 13C1, 0000,003C,69F0,2C00,0000,13C2
 U 13C2, 0000,003C,ED80,0800,0084,73C3
 U 13C3, 0000,003C,0580,0800,0084,93C4
 U 13C4, 0803,0010,0180,0800,0000,13C5
 U 13C5, 001D,2024,01C0,09E8,0000,13C6
 U 13C6, 0800,003C,0180,0A38,0000,13C7
 U 13C7, 001D,2000,0180,0800,0010,13C8
 U 13C8, 0001,013C,0180,09F0,0000,11BE
 U 11BE, 0000,003D,0180,0800,0000,11E0
 U 11BF, 0010,0038,0180,0938,0200,13C9
 U 13C9, 0010,0038,0180,09E0,0000,13CA
 U 13CA, 0000,003C,0180,0A20,0082,13CB
 U 13CB, 0000,003C,01C0,0A68,0000,13CC

Address	Instruction	Comment
U 13CC, 0001, 2034, 01C0, 0A60, 0000, 11C0	:3179	ALU_Q.AND.MASK,Q,ALU_LAB,R[0C]
U 11C0, 001C, 0031, 01C0, 0AB0, 0000, 1080	:3180	ALU_LA[OR]Q,Q_ALD,R[6]_ALU,CALL,J/RELSUB
U 11C1, 0000, 003C, 01C0, 0A30, 0000, 13CD	:3181	Q,R[6]
U 13CD, 0001, 203C, 0180, 09D8, 0000, 11C2	:3182	R[0B],Q
U 11C2, 0001, 203D, 0180, 0AC0, 0000, 1078	:3183	=0 R[8],Q,CALL,J/TBWRO
U 11C3, 0000, 003C, 0180, 6000, 0000, 13CE	:3184	FS/MCT,MCT/READ.V.NEWPC
U 13CE, 0010, 0038, 0180, 0908, 0200, 13CF	:3185	VA,R[1]
U 13CF, 0000, 003C, 0180, F800, 0000, 13D0	:3186	FS7MCT,MCT/ALLOW.IB.READ
U 13D0, 0000, 003C, 69F0, 2C00, 0000, 13D1	:3187	Q_ID[TIME.ADDR]
U 13D1, 0000, 003C, ED80, 0800, 0084, 73D2	:3188	SC_K[.1B]
U 13D2, 0000, 003C, 0580, 0800, 0084, 93D3	:3189	SC-SC+K[.1]
U 13D3, 0803, 0010, 0180, 0800, 0000, 13D4	:3190	ALD_MASK+1,D,ALU
U 13D4, 001D, 2024, 01C0, 09E8, 0000, 13D5	:3191	ALU_Q[ANDNOT]D,Q_ALU,R[0D]_ALU
U 13D5, 0800, 003C, 0180, 0A38, 0000, 13D6	:3192	D,R[7]
U 13D6, 001D, 2000, 0180, 0800, 0010, 13D7	:3193	ALU_Q-D,CLK.UBCC
U 13D7, 0001, 013C, 0180, 09F0, 0000, 11C4	:3194	Z?,R[0E]_D
U 11C4, 0000, 003D, 0180, 0800, 0000, 11E0	:3195	=0 ERROR1
	:3196	; SEE IF GROUP 1 IS INTACT.
U 11C5, 0018, 0038, D580, 09F8, 0000, 13D8	:3197	R[0F],K[.6]
U 13D8, 0010, 0038, 0180, 0908, 0200, 13D9	:3198	VA,R[1]
U 13D9, 0010, 0038, 0180, 09D0, 0000, 13DA	:3199	R[0A],LC
U 13DA, 0000, 003C, 0180, 0910, 0000, 1050	:3200	LC,R[2]
U 1050, 0010, 0039, 0180, 0AB8, 0000, 1226	:3201	=000 R[7],LC,CALL,J/HIT1
U 1051, 0000, 003D, 0180, 0800, 0000, 11E0	:3202	ERROR1
U 1052, 0000, 003D, 0180, 0800, 0000, 11E0	:3203	ERROR1
U 1053, 0000, 003D, 0180, 0800, 0000, 11E0	:3204	ERROR1
U 1054, 0000, 003D, 0180, 0800, 0000, 11F9	:3205	CALL,J/RELCHK
U 1055, 0000, 003D, 0180, 0800, 0000, 11E0	:3206	ERROR1
U 1056, 0000, 003D, 0180, 0800, 0000, 11E0	:3207	ERROR1
U 1057, 0000, 003C, 0180, 0A20, 0010, 13DB	:3208	ALU_R[4],CLK.UBCC
U 13DB, 0000, 013C, 0180, 0800, 0000, 11C6	:3209	Z?
U 11C6, 0018, 0000, 0580, 0AA0, 0000, 11B7	:3210	=0 R[4]_LA-K[.1],J/HOP1BB
U 11C7, 0000, 003C, 0180, 0800, 0000, 13DC	:3211	NOP
U 13DC, 0000, 003D, 0180, 0800, 0000, 11CC	:3212	DUMMY: NEWTST

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	3002=	3003=	3004=	3005=
U 1008	2780=	2781=	2782=	2783=	2784=	2785=	2786=	2787=
U 1010	3007=	3008=	3009=	3010=	1862=	1863=	1839	2301=
U 1018	3012=	3013=	3014=	3015=	1951=	1952=	1840	2302=
U 1020	2985=	2986=	2987=	2988=	2989=	2990=	2991=	2992=
U 1028	2993=	2994=	2995=	2996=	2997=	2998=	2999=	3000=
U 1030	3017=	3018=	3019=	3020=	1970=	1971=	1841	2329=
U 1038	3022=	3023=	3024=	3025=	1972=	1973=	1842	2330=
U 1040	2829=	2830=	2831=	2832=	2833=	2834=	2835=	2836=
U 1048	3027=	3028=	3029=	3030=	1982=	1983=	1902:	1843
U 1050	3201=	3202=	3203=	3204=	3205=	3206=	3207=	3208=
U 1058	1984=	1985=	1905:	1844	1986=	1987=	1908:	1864
U 1060	3032=	3033=	3034=	3035=	3037=	3038=	3039=	3040=
U 1068	3042=	3043=	3044=	3045=	3047=	3048=	3049=	3050=
U 1070	3052=	3053=	3054=	3055=	3057=	3058=	3059=	3060=
U 1078	1992=	1993=	1996=	1997=	2859=	2860=	2861=	2862=
U 1080	2006=	2007=	2008=	2009=	2025=	2026=	2027=	2028=
U 1088	2037=	2038=	2053=	2054=	2058=	2059=	2075=	2076=
U 1090	2078=	2079=	2083=	2084=	2111=	2112=	2114=	2115=
U 1098	2117=	2118=	2121=	2122=	2881=	2882=	2883=	2884=
U 10A0	2124=	2125=	2127=	2128=	2131=	2132=	2135=	2136=
U 10A8	2175=	2176=	2180=	2181=	2183=	2184=	2185=	2186=
U 10B0	2190=	2191=	2193=	2194=	2195=	2196=	2200=	2201=
U 10B8	2203=	2204=	2205=	2206=	2907=	2908=	2909=	2910=
U 10C0	2210=	2211=	2213=	2214=	2267=	2268=	2270=	2271=
U 10C8	2272=	2273=	2280=	2281=	2282=	2283=	2293=	2294=
U 10D0	2297=	2298=	2308=	2309=	2310=	2311=	2321=	2322=
U 10D8	2325=	2326=	2337=	2338=	2930=	2931=	2932=	2933=
U 10E0	2339=	2340=	2350=	2351=	2354=	2355=	2362=	2363=
U 10E8	2364=	2365=	2375=	2376=	2379=	2380=	2386=	2387=
U 10F0	2388=	2389=	2399=	2400=	2403=	2404=	2409=	2410=
U 10F8	2411=	2412=	2422=	2423=	2956=	2957=	2958=	2959=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1865	2426=	2427=	1834:	1835:	1836:	1837:
U 1110	2432=	2433=	2434=	2435=	2445=	2446=	2449=	2450=
U 1118	2476=	2477=	2478=	2479=	2979=	2980=	2981=	2982=
U 1120	2486=	2487=	2489=	2490=	2491=	2492=	2493=	2494=
U 1128	2500=	2501=	2503=	2504=	2516=	2517=	2520=	2521=
U 1130	2524=	2525=	2535=	2536=	2539=	2540=	2543=	2544=
U 1138	2570=	2571=	2572=	2573=	2579=	2580=	2582=	2583=
U 1140	2584=	2585=	2586=	2587=	2593=	2594=	2604=	2605=
U 1148	2608=	2609=	2612=	2613=	2623=	2624=	2627=	2628=
U 1150	2631=	2632=	2657=	2658=	1866	1928=	2659=	2660=
U 1158	2661=	2662=	2663=	2664=	2677=	2678=	2681=	2682=
U 1160	2685=	2687=	2726=	2727=	2728=	2729=	2730=	2731=
U 1168	2733=	2734=	2737=	2738=	2741=	2742=	2743=	2744=
U 1170	2746=	2747=	2759=	2760=	2766=	2767=	2770=	2771=
U 1178	2776=	2777=	2788=	2789=	2219:	2220:	2221:	2222:
U 1180	2792=	2793=	2795=	2796=	2808=	2809=	2815=	2816=
U 1188	2819=	2820=	2825=	2826=	2849=	2850=	2853=	2855=
U 1190	2871=	2872=	2875=	2877=	2897=	2898=	2901=	2903=
U 1198	2920=	2921=	2924=	2926=	2946=	2947=	2950=	2952=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2969=	2970=	2973=	2975=	3084=	3085=	3086=	3087=
U 11A8	3093=	3094=	3106=	3107=	3119=	3120=	3122=	3123=
U 11B0	3143=	3144=	3145=	3146=	3147=	3148=	3149=	3150=
U 11B8	3152=	3153=	3159=	3160=	3162=	3163=	3174=	3175=
U 11C0	3180=	3181=	3183=	3184=	3195=	3197=	3210=	3211=
U 11C8	1867	1868	1869	1870	1880	1881	1882	1883
U 11D0	1884	1885	1886	1887	1888	1889	1890	1891
U 11D8	1892	1893	1894	1895	1896	1897	1898	1899
U 11E0	1900	1901	1903	1904	1936	1937	1943	1944
U 11E8	1945	1950	1953	1954	1957	1958	1959	1960
U 11F0	1963	1964	1965	1988	1989	1999	2010	2011
U 11F8	2012	2018	2019	2020	2223:	2224:	2225:	2226:
U 1200	2021	2022	2023	2024	2029	2030	2031	2032
U 1208	2033	2034	2035	2036	2039	2040	2045	2046
U 1210	2047	2048	2049	2050	2051	2052	2055	2056
U 1218	2057	2066	2067	2068	2069	2070	2071	2072
U 1220	2073	2074	2077	2080	2081	2082	2086	2088
U 1228	2089	2090	2091	2092	2093	2094	2095	2096
U 1230	2097	2098	2099	2100	2101	2102	2103	2104
U 1238	2105	2106	2107	2108	2109	2113	2119	2123
U 1240	2129	2133	2137	2163	2164	2165	2166	2167
U 1248	2168	2169	2170	2171	2172	2173	2174	2177
U 1250	2178	2179	2182	2187	2188	2189	2192	2197
U 1258	2198	2199	2202	2207	2208	2209	2212	2218
U 1260	2269	2284	2285	2286	2287	2288	2289	2290
U 1268	2291	2292	2295	2296	2299	2300	2312	2313
U 1270	2314	2315	2316	2317	2318	2319	2320	2323
U 1278	2324	2327	2328	2341	2342	2343	2344	2345
U 1280	2346	2347	2348	2349	2352	2353	2366	2367
U 1288	2368	2369	2370	2371	2372	2373	2374	2377
U 1290	2378	2390	2391	2392	2393	2394	2395	2396
U 1298	2397	2398	2401	2402	2413	2414	2415	2416
U 12A0	2417	2418	2419	2420	2421	2424	2425	2436
U 12A8	2437	2438	1929:	2439	2440	2441	2442	2443
U 12B0	2444	2447	2448	2480	2481	2482	2483	2484
U 12B8	2485	2488	2495	2496	2497	2498	2499	2502
U 12C0	2505	2506	2507	2508	2509	2510	2511	2512
U 12C8	2513	2514	2515	2518	2519	2522	2523	2526
U 12D0	2527	2528	2529	2530	2531	2532	2533	2534
U 12D8	2537	2538	2541	2542	2574	2575	2576	2577
U 12E0	2578	2581	2588	2589	2590	2591	2592	2595
U 12E8	2596	2597	2598	2599	2600	2601	2602	2603
U 12F0	2606	2607	2610	2611	2614	2615	2616	2617
U 12F8	2618	2619	2620	2621	2622	2625	2626	2629
U 1300	2630	2665	2666	2667	2668	2669	2670	2671
U 1308	2672	2673	2674	2675	2676	2679	2680	2683
U 1310	2684	2732	2735	2736	2739	2740	2745	2748
U 1318	2749	2750	2751	2752	2753	2754	2755	2756
U 1320	2757	2758	2761	2762	2763	2764	2765	2768
U 1328	2769	2772	2773	2774	2775	2778	2779	2790
U 1330	2791	2794	2797	2798	2799	2800	2801	2802
U 1338	2803	2804	2805	2806	2807	2810	2811	2812
U 1340	2813	2814	2817	2818	2821	2822	2823	2824

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2827	2828	2837	2840	2841	2842	2843	2844
U 1350	2845	2846	2847	2848	2851	2852	2857	2858
U 1358	2863	2864	2865	2866	2867	2868	2869	2870
U 1360	2873	2874	2879	2880	2885	2888	2889	2890
U 1368	2891	2892	2893	2894	2895	2896	2899	2900
U 1370	2905	2906	2911	2912	2913	2914	2915	2916
U 1378	2917	2918	2919	2922	2923	2928	2929	2934
U 1380	2937	2938	2939	2940	2941	2942	2943	2944
U 1388	2945	2948	2949	2954	2955	2960	2961	2962
U 1390	2963	2964	2965	2966	2967	2968	2971	2972
U 1398	2977	2978	2983	3061	3088	3089	3090	3091
U 13A0	3092	3095	3096	3097	3098	3099	3100	3101
U 13A8	3102	3103	3104	3105	3108	3109	3110	3111
U 13B0	3112	3113	3114	3115	3116	3117	3118	3121
U 13B8	3151	3154	3155	3156	3157	3158	3161	3164
U 13C0	3165	3166	3167	3168	3169	3170	3171	3172
U 13C8	3173	3176	3177	3178	3179	3182	3185	3186
U 13D0	3187	3188	3189	3190	3191	3192	3193	3194
U 13D8	3198	3199	3200	3209	3212			
U 13E0 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

22-ESKAH-V132 Line Number Index
ESKAH29.MCR

MICRO2 1M(01)

16-DEC-82 11:10:00

I 5

SEQ 0468
Page 8

22
ES

Words not
in bounds

ESKOODEF	0
ESKOO MAC	0
ESKAHMAC	0
ESKAH29	1005

Used 1005
Remaining

Total microwords used in memory U: 1005
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

22
ES
CCCC
CCCC
CCCC


```

3      Control ROM Field Definitions
548    Register Transfer Macro Definitions
1413   Non-transfer Functions
1485   Branch Enable Macro Definitions
1564   MICRO DIAGNOSTIC DEFINED MACROS
1806   MICRO TRAP HANDLER AND LSI-MONITOR CALL ROUTINES
2312   TEST B3 READ.V.NEWPC, HIT IN GROUP 1, TEST
2404   TEST B4 TB GROUP 0 PTE MEMORY STATIC TEST
2484   TEST B5 TB GROUP 1 PTE MEMORY STATIC TEST
2564   TEST B6 TB GROUP 0 TAG MEMORY STATIC TEST
2642   TEST B7 TB GROUP 1 TAG MEMORY STATIC TEST
2721   TEST B8 DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS MATRIX
2812   TEST B9 DUAL ADDRESSING TEST OF TRANSLATION BUFFER DATA MATRIX
2974   TEST BA DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY
3130   TEST BB DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)

```


							:1806
							:1807
							:1808
							:1809
							:1810
							:1811
							:1812
							:1813
							:1814
							:1815
							:1816
							:1817
							:1818
							:1819
							:1820
							:1821
							:1822
							:1823
							:1824
U	1100.	0000.	003C.	1980.	0800.	0084.	7003 :1825
U	1101.	0000.	003C.	0580.	0800.	0084.	7001 :1826
U	1102.	0000.	003C.	0980.	0800.	0084.	7001 :1827
U	1103.	0000.	003C.	0D80.	0800.	0084.	7001 :1828
U	1104.	0000.	003C.	1180.	0800.	0084.	7001 :1829
U	1105.	0000.	003C.	D580.	0800.	0084.	7001 :1830
U	1106.	0000.	003C.	D980.	0800.	0084.	7001 :1831
U	1107.	0000.	003C.	5D80.	0800.	0084.	7001 :1832
U	1108.	0000.	003C.	0180.	0800.	0084.	7001 :1833
U	110C.	0000.	003C.	8580.	0800.	0084.	7003 :1834
U	110D.	0000.	003C.	8980.	0800.	0084.	7003 :1835
U	110E.	0000.	003C.	6580.	0800.	0084.	7001 :1836
U	110F.	0000.	003C.	6180.	0800.	0084.	7003 :1837
U	1001.	0000.	003C.	01C0.	0A78.	0000.	1006 :1838
U	1006.	0001.	2024.	0180.	0800.	0010.	100E :1839
U	100E.	0000.	013C.	0180.	0800.	0000.	1002 :1840
U	1002.	0001.	2036.	0180.	0AF8.	0000.	0000 :1841
							:1842
							:1843
							:1844
							:1845
							:1846
							:1847
							:1848
							:1849
							:1850
							:1851
							:1852
							:1853
							:1854
							:1855
							:1856
U	1003.	0018.	0038.	1D80.	09E8.	0000.	1004 :1857
U	1004.	0000.	003D.	D980.	0800.	0084.	7190 :1858
U	1005.	0000.	003C.	49F0.	2C00.	0000.	1016 :1859
U	1016.	0001.	203C.	4DF0.	2DB0.	0000.	101E :1860

```

      TOC      'MICRO TRAP HANDLER AND LSI-MONITOR CALL ROUTINES'
REGION/1000,13FF
+
FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
R[OF] AND DO A RETURN.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
TO THE CONSOLE.

-
1100: SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
1101: SC_K[.1],J/TRPH0       ; DATA UNALIGNED
1102: SC_K[.2],J/TRPH0       ; X PAGE ERROR
1103: SC_K[.3],J/TRPH0       ; TB MODIFY
1104: SC_K[.4],J/TRPH0       ; TB PROT ERROR
1105: SC_K[.6],J/TRPH0       ; TB MISS
1106: SC_K[.9],J/TRPH0       ; RES FLOAT OPER
1107: SC_K[.7],J/TRPH0       ; TB PARITY
1108: SC_K[.8],J/TRPH0       ; CACHE PARITY
110C: SC_K[.C],J/TRPH1       ; RDS
110D: SC_K[.D],J/TRPH1       ; TIME OUT
110E: SC_K[.10],J/TRPH0      ; ODD ADDRESS
110F: SC_K[.F],J/TRPH1      ; CS PARITY
TRPH0: Q R[OF]
      ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
      Z?                               ; BRANCH IF NO
=0    ALU_Q.AND.MASK,R[OF]_ALL,RETURNO ; CLEAR THE BIT AND RETURN
+
THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER
      CACHE PARITY REGISTER
      TB ERROR REGISTER 1
      TB ERROR REGISTER 0

-
TRPH1: RC[UD],SC
=0     SETRCF[.9]
      Q_ID[TBER0]
      RC[6],Q,Q_ID[TBER1]

```

U 101E, 0001,203C,65F0,2DB8,0000,1026 :1861
U 102E, 0001,203C,6DF0,2DD8,0000,102E :1862
U 102E, 0001,203C,75F0,2DE0,0000,1036 :1863
U 103E, 0001,203C,79F0,2DC8,0000,103E :1864
U 103E, 0001,203C,69F0,2DC0,0000,104F :1865
U 104F, 0001,203C,81F0,2DD0,0000,1000 :1866
U 1000, 0001,203D,0180,09F0,0000,118A :1867

RC[7] Q,Q ID[SBI.ERR]
RC[0B] Q,Q ID[FAULT]
RC[0C] Q,Q ID[MAINT]
RC[9] Q,Q ID[PARITY]
RC[8] Q,Q ID[TIME.ADDR]
RC[0A] Q,Q ID[USTACK]
1000: RC[0E] Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWST
ERLOOP
ERROR1
ERROR2

U 105B, 0000,003C,65F8,0800,0084,705F :1876
U 105F, 0818,0038,8D80,0800,0000,1109 :1877
U 1109, 0000,003C,0180,0800,0000,1154 :1878
U 1154, 0000,003C,3D80,3C00,0000,1178 :1879
U 1178, 0818,0038,0580,0800,0000,1179 :1880
U 1179, 0000,003C,0180,0800,0000,117A :1881
U 117A, 0F00,003C,3180,3C00,0000,117B :1882
U 117B, 0000,003C,5D80,3C00,0000,1180 :1883
U 1180, 0000,003C,3980,3C00,0000,1181 :1884
U 1181, 0000,003C,2980,3C00,0000,1182 :1885
U 1182, 0000,003C,4980,3C00,0000,1183 :1886
U 1183, 0818,0038,0180,0800,0000,1184 :1887
U 1184, 0000,003C,6580,3C00,0000,1185 :1888
U 1185, 0F00,003C,6D80,3C00,0000,1186 :1889
U 1186, 0000,003C,6D80,3C00,0000,1187 :1890
U 1187, 0000,003C,6580,3C00,0000,1188 :1891
U 1188, 0003,003C,0180,0AF8,0000,105E :1892
U 1189, 0818,0038,0980,0800,0000,105E :1893
U 118A, 0810,0038,0180,0978,0000,118B :1894
U 118B, 0819,0034,4D80,0800,0000,104E :1895
U 104E, 0819,0030,1180,0800,0000,105E :1896
U 118C, 0810,0038,0180,0978,0000,118D :1897
U 118D, 0819,0034,4D80,0800,0000,105A :1898
U 105A, 0819,0030,D580,0800,0000,105E :1899

SCOPE: SC KC,10],Q_0 : SETUP TO WRITE IPL OF 1F
D_KC,1F] : ...
D-DAL.SC :
ID[PSL] D : WRITE THE PSL
D_KC,1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC :
ID[CES] D,D_0 : CLEAR THE CES REGISTER
ID[ACC.TS] D : SHUT OFF THE FLOATING POINT
ID[SIR] D : CLEAR THE SIR REGISTER
ID[CLK.TS] D : STOP INTERVAL TIMER
ID[IBERO] D : SHUT OFF THE TB
D_KC,FFFF] :
ID[SBI.ERR] D :
ID[FAULT] D,D_0 :
ID[FAULT] D :
ID[SBI.ERR] D :
R[0F] Q,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_KC,2],J/CALLCON : ERRLOOP CALL
ERROR1: D-RC[0F]
D-D.AND.KC,FF00]
104E: D-D.OR.KC,4],J/CALLCON
ERROR2: D-RC[0F]
D-D.AND.KC,FF00]
105A: D-D.OR.KC,6],J/CALLCON
105E:
CALLCON: ID[TXDB] D,J/CALLCON : CALL THE CONSOLE

U 105E, 0000,003C,1D80,3C00,0000,105E :1902

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 13F0, 0000,003C,0180,0800,0000,13F1 :1906
U 13F1, 0000,003C,0180,0800,0000,13F2 :1907
U 13F2, 0000,003C,0180,0800,0000,13F3 :1908
U 13F3, 0000,003C,0180,0800,0000,13F4 :1909
U 13F4, 0000,003C,0180,0800,0000,13F5 :1910
U 13F5, 0000,003C,0180,0800,0000,13F6 :1911
U 13F6, 0000,003C,0180,0800,0000,13F7 :1912
U 13F7, 0000,003C,0180,0800,0000,13F8 :1913
U 13F8, 0000,003C,0180,0800,0000,13F9 :1914
U 13F9, 0000,003C,0180,0800,0000,13FA :1915

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP

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U 13FA, 0000,003C,0180,0800,0000,13FB :1916
U 13FB, 0000,003C,0180,0800,0000,13FC :1917
U 13FC, 0000,003C,0180,0800,0000,13FD :1918
U 13FD, 0000,003C,0180,0800,0000,13FE :1919
U 13FE, 0000,003C,0180,0800,0000,13FF :1920
U 13FF, 0000,003C,0180,0800,0000,1155 :1921
U 1155, 0000,003C,0180,0800,0000,12AA :1922
U 12AA, 0000,003C,0180,0800,0000,118E :1923
:1924
:1925
:1926
:1927
:1928
:1929
U 118E, 0810,0038,4D80,0978,0000,118F :1930
U 118F, 0019,4016,4D80,09F8,0000,0001 :1931
:1932
:1933
:1934
:1935
:1936
U 1190, 0010,0038,01C0,0978,0000,1191 :1937
U 1191, 0019,2034,4DC0,0800,0000,1192 :1938
U 1192, 0019,2032,1D80,09F8,0000,0001 :1939
:1940
:1941
:1942
:1943
U 1193, 0F18,0038,C1F8,0800,0000,1008 :1944
U 1008, 0500,003D,8780,0800,0084,71D8 :1945
U 1009, 0D00,003C,0180,0800,0000,1194 :1946
U 1194, 0000,003E,7580,3C00,0000,0001 :1947
:1948
:1949
U 1195, 0818,0038,0DF8,0800,0000,1196 :1950
U 1196, 0000,003C,6180,0800,0084,7197 :1951
U 1197, 0D00,003C,0180,0800,0000,1198 :1952
U 1198, 0000,003E,7580,3C00,0000,0001 :1953
:1954
:1955
U 1199, 0000,003C,8580,0800,0084,719A :1956
U 119A, 0803,001C,0180,0800,0000,119B :1957
U 119B, 0000,003E,7580,3C00,0000,0001 :1958
:1959
:1960
:1961
:1962
U 100A, 0000,003D,0180,0800,0000,11DC :1963
U 100B, 0000,003C,0180,0800,0000,11DD :1964
:1965
:1966
:1967
:1968
:1969
:1970

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13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP
:
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:
SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1
:
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:
SETRCF: Q RC[0F]
Q-Q,AND,K[.FF00]
RC[0F],Q,OR,SC,RETURN1
: THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
: AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
: UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
: ARE LOST.
CSOFF: D 0,Q 0,ALU K[.FFFF]
=0 SC K[C],D D.LEFT,S1/7,CALL,J/DC9
D DAL,SC
ID[MAINT] D,RETURN1
: THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
: BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
COFF: D K[3],Q 0
SC K[F]
D DAL,SC
ID[MAINT] D,RETURN1
: THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
: APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
SOFF: SC K[C]
ALD NOT,MASK,D ALU
ID[MAINT] D,RETURN1
: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.
=0
DC.DE: CALL,J/DCD
J/DCE
: THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
: IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
: VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
: MME WILL BE SET HERE. UPON RETURN THE CONTENTS
: OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
: D AND Q ARE LOST.

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```

; THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DC8
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWRA: ID[TBER0] D,D_R[8]
ID[TBUF] 0
Q_ID[TBER1],RETURN1
; ROUTINE TO WRITE GROUP 0
=0
TBWRO: D_0,CALL,J/DC4
J7TBWR
; ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DC8
D_D.LEFT,SI/ZERO,J/TBWR
; THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D_K[1],J/TBWRA
; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC_K[9],LAB_R[5]
=0 ALU_MASK+1,Q_ALU,CALL,J/DC0
ALU_LA[ANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
; INDICATED IN R[E].
RELCHK: LAB_R[OE]
R[OF] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERENCE
Q_ID[TIME.ADDR],D_R[OF]
ALU_O(K),R[OF],ALU
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
??
=0 R[9]_D,J/TBTRUE ; TRAPPED SO RETURN1.
NOP
=0 D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
D_D.LEFT,SI/ZERO
SC D
ALU_MASK+1,D_ALU
ALU_Q[ANDNOT]D,Q_ALU
D_R[7] ; SEE IF ADDRESS RELOCATED
R[OC] D
R[OB]-Q

```



```
U 11AF, 001D,2000,0180,0800,0010,11B0 :2026
U 11B0, 0000,013C,0180,0800,0000,1024 :2027
U 1024, 0000,003E,0180,0800,0000,0002 :2028
U 1025, 0000,003E,0180,0800,0000,0003 :2029
U 11B1, 0000,003C,4DF0,2C00,0000,11B2 :2030
U 11B2, 0001,203E,0180,09F0,0000,0001 :2031
:2032
:2033
:2034
:2035
U 11B3, 0000,003C,0180,0A70,0000,11B4 :2036
U 11B4, 0000,003C,0180,52F8,0000,11B5 :2037
U 11B5, 0800,003C,0180,0A78,0000,11B6 :2038
U 11B6, 0018,0038,1980,0AF8,0000,11B7 :2039
U 11B7, 0000,003C,0180,0A70,0000,11B8 :2040
U 11B8, 0001,003C,0180,09C8,0000,11B9 :2041
U 11B9, 001C,2000,0180,0800,0010,11BA :2042
U 11BA, 0000,013C,0180,0800,0000,1028 :2043
U 1028, 0000,003C,D580,0800,0084,71BB :2044
U 1029, 0000,003E,0180,0800,0000,0001 :2045
:2046
U 11BB, 0001,0024,0180,0800,0010,11BC :2047
U 11BC, 0000,013C,4DF0,2C00,0000,102A :2048
U 102A, 0001,203E,0180,09F0,0000,0002 :2049
U 102B, 0000,003E,0180,0800,0000,0003 :2050
:2051
:2052
:2053
:2054
:2055
:2056
U 11BD, 0000,003C,D580,0A70,0084,71BE :2057
U 11BE, 0000,003C,0180,52F8,0000,11BF :2058
U 11BF, 0800,003C,49F0,2E78,0000,11C0 :2059
U 11C0, 0018,0038,1980,0AF8,0000,11C1 :2060
U 11C1, 0001,203C,0180,09E8,0000,11C2 :2061
U 11C2, 0003,001C,0180,09F0,0000,11C3 :2062
U 11C3, 0000,003C,0180,0A70,0000,11C4 :2063
U 11C4, 001C,2000,0180,0800,0010,11C5 :2064
U 11C5, 0001,013C,0180,09C8,0000,102C :2065
U 102C, 0000,003C,0180,0800,0000,11C7 :2066
U 102D, 0001,2024,0180,0800,0010,11C6 :2067
U 11C6, 0000,013C,0180,0800,0000,1030 :2068
U 1030, 0000,003E,0180,0800,0000,0004 :2069
U 1031, 0000,003E,0180,0800,0000,0003 :2070
U 11C7, 0000,003C,D580,0800,0084,71C8 :2071
U 11C8, 0001,0024,0180,0800,0010,11C9 :2072
U 11C9, 0000,013C,0180,0800,0000,1032 :2073
U 1032, 0000,003C,0180,0800,0000,11B1 :2074
U 1033, 0000,003E,0180,0800,0000,0002 :2075
:2076
U 11CA, 0000,003C,5D80,0A70,0084,71BE :2077
:2078
U 11CB, 0118,0038,1B80,0800,0000,11DF :2079
U 11CC, 0118,0038,0B80,0800,0000,11DF :2080

ALU_Q-D,CLK.UBCC ; PROPERLY.
Z?
=0 RETURN2 ; INCORRECT.
RETURN3 ; OK
TBTRUE: Q_ID[TBER1]
RC[OE] Q,RETURN1
; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
; IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
MISS: LAB RC[OE]
RC[OF] LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
D RC[OF]
ALU_Q(K),RC[OF],ALU
LAB RC[OE]
RC[9] D
ALU_L[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?
=0 SC K[.6],J/MISSA
RETURN1 ; NO TRAP SO RETURN1.
; IF A TRAP OCCURRED SEE
; IF IT WAS A TB MISS TRAP.
MISSA: ALU D.ANDNOT.MASK,CLK.UBCC
Z?,Q_ID[TBER1]
=0 RETURN2,RC[OE],Q ; NOT TB MISS.
RETURN3 ; TB MISS.
; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
; HIT/MISS BIT IN TBER0 IS INCORRECT.
; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
; CHECK HIT IN GROUP 0.
HITO: LAB RC[OE],SC K[.6]
HIT: RC[OF] LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
Q_ID[TBER0],D RC[OF]
ALU_Q(K),RC[OF],ALU
RC[OD] Q
RC[OE] ALU,ALU_NOT.MASK
LAB RC[OE]
ALU_L[A-B]D,CLK.UBCC ; SEE IF TRAP OCCURRED.
Z?,RC[9]_D
=0 J/HITA ; TRAP OCCURRED.
ALU_Q.ANDNOT.MASK,CLK.UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?
Z?
=0 RETURN4 ; SET SO IT WAS A HIT.
RETURN3 ; CLEAR SO REFERENCE WAS A MISS.
HITA: SC K[.6] ; TRAPPED, SO SEE IF TB MISS TRAP.
ALU_D.ANDNOT.MASK,CLK.UBCC
Z?
=0 J/TBTRUE ; NOT TB MISS TRAP.
RETURN2 ; TB MISS TRAP OCCURRED.
; CHECK HIT IN GROUP 1.
HIT1: LAB RC[OE],SC K[.7],J/HIT
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
S00: ALU_Q(K),D D.LEFT2,S1/7,J/SX
S01: ALU_K[.2],D D.LEFT2,S1/7,J/SX
```

U 11CD, 0118,0038,0780,0800,0000,11DF :2081
U 11CE, 0118,0038,C380,0800,0000,11DF :2082
U 11CF, 0018,0038,1980,0800,0000,11CB :2083
U 11D0, 0018,0038,1980,0800,0000,11CC :2084
U 11D1, 0018,0038,1980,0800,0000,11CD :2085
U 11D2, 0018,0038,1980,0800,0000,11CE :2086
U 11D3, 0018,0038,0980,0800,0000,11CB :2087
U 11D4, 0018,0038,0980,0800,0000,11CC :2088
U 11D5, 0018,0038,0980,0800,0000,11CD :2089
U 11D6, 0018,0038,0980,0800,0000,11CE :2090
U 11D7, 0018,0038,0580,0800,0000,11CB :2091
U 11D8, 0018,0038,0580,0800,0000,11CC :2092
U 11D9, 0018,0038,0580,0800,0000,11CD :2093
U 11DA, 0018,0038,0580,0800,0000,11CE :2094
U 11DB, 0018,0038,C180,0800,0000,11CB :2095
U 11DC, 0018,0038,C180,0800,0000,11CC :2096
U 11DD, 0018,0038,C180,0800,0000,11CD :2097
U 11DE, 0018,0038,C180,0800,0000,11CE :2098
U 11DF, 0100,003E,0380,0800,0000,0001 :2099
U 11E0, 0018,0038,01C0,0800,0000,1034 :2100
U 1034, 0000,003D,0180,0800,0000,11D4 :2101
U 1035, 0019,2000,05C0,0800,0010,11E1 :2102
U 11E1, 0000,013C,0180,0800,0000,1038 :2103
U 1036, 0000,003C,0180,0800,0000,1034 :2104
U 1039, 0000,003E,0180,0800,0000,0001 :2105
U 103A, 0000,003D,0180,0800,0000,11E0 :2106
U 103B, 0500,003E,0180,0800,0000,0001 :2107
U 11E2, 0018,0038,01C0,0800,0000,103C :2108
U 103C, 0000,003D,0180,0800,0000,11D8 :2109
U 103D, 0019,2000,05C0,0800,0010,11E3 :2110
U 11E3, 0000,013C,0180,0800,0000,1048 :2111
U 1048, 0000,003C,0180,0800,0000,103C :2112
U 1049, 0000,003E,0180,0800,0000,0001 :2113
U 104A, 0000,003D,0180,0800,0000,11E2 :2114
U 104B, 0018,0038,C180,0800,0000,11E4 :2115
U 11E4, 0600,003E,0380,0800,0000,0001 :2116
U 104C, 0000,003D,0180,0800,0000,11E2 :2117
U 104D, 0018,0038,0580,0800,0000,11E5 :2118
U 11E5, 0100,003E,0380,0800,0000,0001 :2119
U 1058, 0000,003D,0180,0800,0000,11E2 :2120
U 1059, 0018,0038,C180,0800,0000,11E6 :2121
U 11E6, 0500,003E,0380,0800,0000,0001 :2122

S10: ALU_K[.1],D,D.LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,S1/7,J/SX
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D,D.LEFT2,S1/7,RETURN1
DC.5: Q_K[.8]
=0
DC.5A: CALL,J/DC5
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0
J/DC.5A
RETURN1
=0
DC.A: CALL,J/DC.5
D,D.LEFT,S1/ZERO,RETURN1
DC.9: Q_K[.8]
=0
DC.9A: CALL,J/DC9
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0
J/DC.9A
RETURN1
=0
DC.C: CALL,J/DC.9
ALU_K[.FFFF]
D,D.RIGHT,S1/7,RETURN1
=0
DC.6: CALL,J/DC.9
ALU_K[.1]
D,D.LEFT2,S1/7,RETURN1
=0
DC.3: CALL,J/DC.9
ALU_K[.FFFF]
D,D.LEFT,S1/7,RETURN1
: THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
: A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
: SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
: FOLLOWING DATA PATTERNS:
: R[0B] 7FFFC000
: R[0C] A4000000

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:2136 :      R[0D]      001FFFFFF
:2137 :
:2138 :      R[0]      A4155555
:2139 :      R[1]      4CCCC000
:2140 :      R[2]      0AAAAA80
:2141 :
:2142 :      R[3]      A4199999
:2143 :      R[4]      55554000
:2144 :      R[5]      0CCCCC80
:2145 :
:2146 :      R[6]      A40AAAAA
:2147 :      R[7]      33330000
:2148 :      R[8]      05555500
:2149 :
:2150 :      R[0]      A4066666
:2151 :      R[1]      2AAA8000
:2152 :      R[2]      03333300
:2153 :
:2154 :      TBWPTP: D_0,ALU_K[.1]
:2155 :      D_D.RIGHT2,SI/7,ALU_K[.2]
:2156 :      D_D.RIGHT2,SI/7,ALU_K[.2]
:2157 :      D_D.RIGHT2,SI/7
:2158 :      R[OC] D,SC_K[F]
:2159 :      ALU_MASK+1,R[OB]_ALU.RIGHT,SI/ZERO
:2160 :      D_0-K[.1]
:2161 :      Q_K[.14]
:2162 :      ALU_Q+K[.1],SC_ALU
:2163 :      ALU_NOT.MASK,Q_ALU
:2164 :      =0 ALU_Q[A+B]D,R[OD] ALU,CALL,J/DC.5
:2165 :      LAB_R[OD],ALU_LA[AND]D,D_ALU
:2166 :      LAB_R[OC],ALU_LA[OR]D,D_ALU
:2167 :      R[0] D
:2168 :      =0 R[6] D,CALL,J/DC.C
:2169 :      LAB_R[OB]
:2170 :      ALU_LA[AND]D,D_ALU,R[1]_ALU
:2171 :      =0 R[5]_D,CALL,J/RELSUB
:2172 :      NOP
:2173 :      =0 R[2] D,CALL,J/DC.9
:2174 :      LAB_R[OD],ALU_LA[AND]D,D_ALU
:2175 :      LAB_R[OC],ALU_LA[OR]D,D_ALU
:2176 :      R[3] D
:2177 :      =0 R[6] D,CALL,J/DC.5
:2178 :      LAB_R[OB]
:2179 :      ALU_LA[AND]D,D_ALU,R[4]_ALU
:2180 :      =0 R[5]_D,CALL,J/RELSUB
:2181 :      NOP
:2182 :      =0 R[5] D,CALL,J/DC.A
:2183 :      LAB_R[OD],ALU_LA[AND]D,D_ALU
:2184 :      LAB_R[OC],ALU_LA[OR]D,D_ALU
:2185 :      R[8] D
:2186 :      =0 R[6] D,CALL,J/DC.3
:2187 :      LAB_R[OB]
:2188 :      ALU_LA[AND]D,D_ALU,R[7]_ALU
:2189 :      =0 R[5]_D,CALL,J/RELSUB
:2190 :      NOP
U 11E7, 0F18,0038,0580,0800,0000,11E8
U 11E8, 0218,0038,0B80,0800,0000,11E9
U 11E9, 0218,0038,0B80,0800,0000,11EA
U 11EA, 0200,003C,0380,0800,0000,11EB
U 11EB, 0001,003C,6180,0AE0,0084,71EC
U 11EC, 0043,0010,0180,0AD8,0000,11ED
U 11ED, 081B,0000,0580,0800,0000,11EE
U 11EE, 0018,0038,21C0,0800,0000,11EF
U 11EF, 0019,2014,0580,0800,0082,11F0
U 11F0, 0003,001C,01C0,0800,0000,105C
U 105C, 001D,2015,0180,0AEB,0000,11E0
U 105D, 081C,2034,0180,0A68,0000,11F1
U 11F1, 081C,2030,0180,0A60,0000,11F2
U 11F2, 0001,003C,0180,0980,0000,107B
U 107B, 0001,003D,0180,0AB0,0000,104A
U 1079, 0000,003C,0180,0A58,0000,11F3
U 11F3, 081C,2034,0180,0988,0000,107A
U 107A, 0001,003D,0180,0AAB,0000,101A
U 107B, 0000,003C,0180,0800,0000,107C
U 107C, 0001,003D,0180,0990,0000,11E2
U 107D, 081C,2034,0180,0A68,0000,11F4
U 11F4, 081C,2030,0180,0A60,0000,11F5
U 11F5, 0001,003C,0180,0998,0000,107E
U 107E, 0001,003D,0180,0AB0,0000,11E0
U 107F, 0000,003C,0180,0A58,0000,11F6
U 11F6, 081C,2034,0180,09A0,0000,1080
U 1080, 0001,003D,0180,0AAB,0000,101A
U 1081, 0000,003C,0180,0800,0000,1082
U 1082, 0001,003D,0180,09A8,0000,103A
U 1083, 081C,2034,0180,0A68,0000,11F7
U 11F7, 081C,2030,0180,0A60,0000,11F8
U 11F8, 0001,003C,0180,09B0,0000,1084
U 1084, 0001,003D,0180,0AB0,0000,105B
U 1085, 0000,003C,0180,0A58,0000,11F9
U 11F9, 081C,2034,0180,09B8,0000,1086
U 1086, 0001,003D,0180,0AAB,0000,101A
U 1087, 0000,003C,0180,0800,0000,108B
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U 1088, 0001,003D,0180,09C0,0000,104C :2191
U 1089, 081C,2034,0180,0A68,0000,11FA :2192
U 11FA, 081C,2030,0180,0A60,0000,11FB :2193
U 11FB, 0001,003C,0180,0A80,0000,108A :2194
U 108A, 0001,003D,0180,0A80,0000,103A :2195
U 108B, 0000,003C,0180,0A58,0000,1200 :2196
U 1200, 081C,2034,0180,0A88,0000,108C :2197
U 108C, 0001,003D,0180,0AA8,0000,101A :2198
U 108D, 0001,003E,0180,0A90,0000,0001 :2199
:2200
:2201
:2202
U 1201, 0000,003F,0180,0800,0000,117C :2203
U 117C, 0000,003E,0180,0800,0000,0001 :2204
U 117D, 0000,003E,0180,0800,0000,0002 :2205
U 117E, 0000,003E,0180,0800,0000,0003 :2206
U 117F, 0000,003E,0180,0800,0000,0004 :2207
U 11FC, 0000,003D,0180,0800,0000,118A :2208
U 11FD, 0000,003D,0180,0800,0000,118A :2209
U 11FE, 0000,003D,0180,0800,0000,118A :2210
U 11FF, 0000,003D,0180,0800,0000,118A :2211
:2212
:2213
:2214
:2215
:2216
:2217
:2218
:2219
:2220
U 1202, 0018,0038,3180,0A80,0000,1203 :2221
U 1203, 0000,003C,D980,0800,0084,7204 :2222
U 1204, 0003,001C,0180,0988,0000,1205 :2223
U 1205, 0003,003C,8D80,0A88,0084,7206 :2224
U 1206, 0000,003C,0180,0A08,0200,1207 :2225
U 1207, 0803,001C,0180,0800,0000,1208 :2226
U 1208, 0000,003C,4180,3C00,0000,1209 :2227
U 1209, 0800,003C,0180,0A00,0000,120A :2228
U 120A, 0019,0000,0580,0A80,0010,120B :2229
U 120B, 0000,013C,0180,0800,0000,108E :2230
U 108E, 0000,003C,7580,0800,0000,120C :2231
U 108F, 0000,003E,0180,0800,0000,0001 :2232
U 120C, 0019,0000,7580,0800,0010,120D :2233
U 120D, 0000,013C,0180,0908,0000,1090 :2234
U 1090, 0F00,003C,0180,0800,0000,120E :2235
U 1091, 0803,001C,0180,0908,0000,120E :2236
:2237
U 120E, 081C,2030,0180,0A08,0000,120F :2238
U 120F, 0811,0014,0180,0800,0000,1210 :2239
U 1210, 0811,0034,0180,0900,0000,1211 :2240
U 1211, 0001,003C,0180,0A88,0000,1206 :2241
:2242
:2243
:2244
:2245

=0 RC[8] D,CALL,J/DC.6
LAB_RC[0D],ALU_LA[AND]D,D,ALU
LAB_RC[0C],ALU_LA[OR]D,D,ALU
RC[0] D
=0 RC[6] D,CALL,J/DC.A
LAB_RC[0B]
ALU_LA[AND]D,D,ALU,RC[1],ALU
=0 RC[5] D,CALL,J/RELSUB
RC[2] D,RETURN1
: THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
: WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
: WHICH COULD RESULT IN ERROR CONDITIONS.
TARGC3: SUB/SPEC
117C: RETURN1
117D: RETURN2
117E: RETURN3
117F: RETURN4
11FC: ERROR1
11FD: ERROR1
11FE: ERROR1
11FF: ERROR1
: THE FOLLOWING SUBROUTINES ARE USED IN THE MOVING INVERSIONS TEST
: OF THE TRANSLATION BUFFER
: -
: +
: FILL THE TB ADDRESS AND DATA MATRIX WITH ZERO'S. ASSUMES THAT THE
: WRITE BOTH BIT IS SET IN TBERO.
: -
FILLZERO:
RC[0] KC.40 : SET THE LOOP COUNT
SC KC.9 : GENERATE THE ADDRESS INCREMENT
RC[1] NOT.MASK
RC[1] 0,SC KC.1F : INIT THE ADDRESS
FILL0P: VA ACU,ALD RC[1] : LOAD THE ADDRESS
D NOT.MASK : GET VALID PTE
ID[TBUF]_D : LOAD THE TB
D RC[0] : LOOP DONE?
RC[0]_D-K[.1],CLK.UBCC
Z?
=0 J/FILLINC,K[.20]
RETURN1
FILLINC: ALU D-K[.20],CLK.UBCC : TIME FOR BIT 31?
Z?,[C RC[1]
D 0,J7NOBIT31FILL
D NOT.MASK,LC_RC[1]
NOBIT31FILL:
D D.OR.RC[1]
D D+LC
D D.AND.RC[0]
RC[1]_D,J/FILL0P
: +
: THIS ROUTINE INCREMENTS (OR DECREMENTS) THE ADDRESS IN RC[3] BY THE
: VALUE IN RC[0C]. RC[4] MUST CONTAIN THE CONCATINATED ADDRESS
: BITS (<31,13:9>) IN BIT POSITIONS <5:0>.


```

:2246
:2247 INCDECADDRESS:
:2248 D_R[4] ; GET CONCATENATED ADDRESS
:2249 Q-R[0C] ; GET INCREMENT VALUE
:2250 A[U_R[0D],CLK.UBCC ; FORWARD SEQ?
:2251 Z?
:2252 =0 J/DECADDRESS ; NO
:2253 D D+Q,SC_K[.6] ; INCREMENT THE ADDRESS
:2254 A[U_D.ANDNOT.MASK,CLK.UBCC ; MASK
:2255 Z?,Q MASK+1 ; OVERFLOW?
:2256 =0 J/INCOVERFLOW ; YES
:2257 R[4]_D,J/SETDATA
:2258 INCOVERFLOW:
:2259 D D+K[.1] ; ADD THE CARRY
:2260 R[4]_D.ANDNOT.Q,J/SETDATA ; THROWAWAY BIT 6
:2261 DECADDRESS:
:2262 D D-Q,CLK.UBCC ; DECREMENT THE ADDRESS
:2263 A[U_N?,Q_K[.3F] ; UNDERFLOW?
:2264 =0111 R[4]_D,J/SETDATA ; NO
:2265 R[4]_D+Q,J/SETDATA ; FIXUP THE UNDERFLOW
:2266 SETDATA:
:2267 SC_K[.1A],D_R[4],Q_0 ; PUT ADDRESS BACK INTO BITS 31
:2268 D_DAL.SC,SC_K[.1F] ; AND 13:9
:2269 R[1]_D.ANDNOT.MASK,SC_K[.9]
:2270 D_R[4].AND.K[.1F],Q_0
:2271 D_DAL.SC
:2272 D_D.OR.R[1]
:2273 Q-R[3]
:2274 Q-Q.ANDNOT.RC[0]
:2275 R[3]_D.OR.Q,RETURN1
:2276
:2277 ;+ THIS ROUTINE LEFT SHIFTS BITS <30:24> AND <23:15> OF R[3]. IF THE
:2278 ; CONTENTS OF RC[0D] IS ZERO, ONE'S ARE INSERTED OTHERWISE, THE FIELD IS
:2279 ; ASSUMED TO BE ALL ONE'S AND ZERO'S ARE INSERTED.
:2280
:2281 SETNEWDATABIT:
:2282 D_R[3],SC_K[.FFF1] ; GET THE DATA TO SHIFT
:2283 SC_SC+K[.3],Q_0 ; SETUP TO SHIFT BITS <30:15>
:2284 D_DAL.SC ; INTO BITS <16:1>
:2285 D_D.AND.K[.FFFF] ; MASK
:2286 D_D.ANDNOT.K[.1] ; CLEAR BIT 0
:2287 A[U_R[2],CLK.UBCC ; DATA = 0?
:2288 Z?
:2289 =0 J/SHIFTINZERO ; NO
:2290 D_D.OR.K[.10] ; INSERT BIT 8
:2291 D_D.OR.K[.1],J/SETDATA ; AND BIT 0
:2292 SHIFTINZERO:
:2293 D D.ANDNOT.K[.10] ; CLEAR BIT 8
:2294 SETADR: SC_K[.F],Q_0 ; SHIFT BACK TO BITS <30:15>
:2295 D_DAL.SC,Q-R[3] ; GET ADDRESS
:2296 Q-Q.AND.RC[0] ; THROW AWAY OLD DATA BITS
:2297 R[3]_D.OR.Q,RETURN1 ; INSERT NEW DATA BITS
:2298 PTESETNEWDATABIT:
:2299 D_R[6] ; GET THE CURRENT DATA
:2300 D_D.LEFT ; SHIFT THE DATA
```

U 1234,	0000,003C,0180,0A10,0010,1235	:2301	ALU_R[2],CLK.UBCC	; DATA = 0?
U 1235,	0000,013C,0180,0800,0000,1098	:2302	Z?	
U 1098,	0000,003C,0180,0800,0000,1236	:2303	=0 J/PTESHIFTINZERO	; NO
U 1099,	081C,2030,0180,0A40,0000,1238	:2304	D D.OR.R[8],J/PTESETDATA	; INSERT THE ONE'S
		:2305	PTESHIFTINZERO:	
U 1236,	0000,003C,01C0,0A40,0000,1237	:2306	Q_R[8]	
U 1237,	081D,0024,0180,0800,0000,1238	:2307	D D.ANDNOT.Q	; CLEAR BIT 0 OF EACH CHIP PATTERN
		:2308	PTESETDATA:	
U 1238,	0001,003C,0180,0AB0,0000,1239	:2309	R[6] D	; GET THE MBZ MASK
U 1239,	0000,003C,01C0,0A28,0000,123A	:2310	Q_R[5]	; SET THE REAL PTE
U 123A,	001D,0026,0180,0AB8,0000,0001	:2311	R[7]_D.ANDNOT.Q,RETURN1	

```

:2312 .PAGE 'TEST B3 READ.V.NEWPC, HIT IN GROUP 1, TEST'
:2313 *****
:2314 **
:2315 TEST B3 READ.V.NEWPC, HIT IN GROUP 1, TEST
:2316
:2317 TEST DESCRIPTION
:2318 THIS IS A TEST OF A READ.V.NEWPC WITH THE VA
:2319 BEING A HIT IN GROUP 1.
:2320 THIS TESTS THE GROUP 1 INPUTS TO THE IPA MUX.
:2321
:2322 LOGIC DESCRIPTION
:2323
:2324 ERROR DESCRIPTION
:2325 EXPECTED IPA (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER)
:2326 ACTUAL IPA (FROM TIME OUT ADDRESS REGISTER)
:2327 VA
:2328 PTE WRITTEN INTO GROUP 1
:2329
:2330 SYNC POINT DESCRIPTION
:2331
:2332 --
:2333 *****
:2334 =0
:2335 H1PIBA: NEWST[.4]
:2336 R[OE] 0
:2337 =0 CALL J/CSOFF ; TURN OFF CACHE,SBI
:2338 R[OF] 0
:2339 =0 CALL J/TBWPTP ; GENERATE TEST PATTERNS
:2340 R[4] K[.14]
:2341 =0 ERLOOP
:2342 H1PIBB: VA_RC[4]
:2343 LC_RC[3]
:2344 =0 R[8] LC, CALL, J/TBWRB ; WRITE BOTH GROUPS
:2345 SC_R[4]
:2346 Q_R[OC]
:2347 A[U Q. ORNOT.MASK, Q_ALU
:2348 VA_R[1]
:2349 R[OC] LA
:2350 R[5] LA
:2351 =0 R[6] Q, CALL, J/RELSUB ; SIMULATE TRANSLATION
:2352 Q_R[6]
:2353 R[OB] Q
:2354 =0 R[8] Q, CALL, J/TBWR1 ; WRITE GROUP 1
:2355 FS/MCT, MCT/READ.V.NEWPC : LOAD IPA
:2356 VA_RC[4]
:2357 FS7MCT, MCT/ALLOW.IB.READ ; LOAD TOAR
:2358 Q_ID[TIME.ADDR]
:2359 SC_K[.1B]
:2360 SC-SC+K[.1]
:2361 ALD_MASK+1, D_ALU
:2362 ALU_Q[ANDNOT]D, Q_ALU, R[OD]_ALU
:2363 D_R[7]
:2364 A[U Q-D, CLK.UBCC
:2365 Z?, R[OE]_D
:2366 =0 ERROR1 ; MUX SELECTS FAILED, WRONG GROUP

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U 109A, 0018,0039,1180,09F8,0000,105B
U 109B, 0003,003C,0180,0AF0,0000,109C
U 109C, 0000,003D,0180,0800,0000,1193
U 109D, 0003,003C,0180,0AF8,0000,109E
U 109E, 0000,003D,0180,0800,0000,11E7
U 109F, 0018,0038,2180,0AA0,0000,10A0
U 10A0, 0000,003D,0180,0800,0000,1189
U 10A1, 0010,0038,0180,0920,0200,123B
U 123B, 0000,0C3C,0180,0918,0000,10A2
U 10A2, 0010,0039,0180,0AC0,0000,1018
U 10A3, 0000,003C,0180,0A20,0082,123C
U 123C, 0000,003C,01C0,0A60,0000,123D
U 123D, 0001,201C,01C0,0800,0000,123E
U 123E, 0000,003C,0180,0A08,0200,123F
U 123F, 0000,003C,0180,09E0,0000,1240
U 1240, 0000,003C,0180,0AA8,0000,10A4
U 10A4, 0001,203D,0180,0AB0,0000,101A
U 10A5, 0000,003C,01C0,0A30,0000,1241
U 1241, 0001,203C,0180,09D8,0000,10A6
U 10A6, 0001,203D,0180,0AC0,0000,100C
U 10A7, 0000,003C,0180,6000,0000,1242
U 1242, 0010,0038,0180,0920,0200,1243
U 1243, 0000,003C,0180,F800,0000,1244
U 1244, 0000,003C,69F0,2C00,0000,1245
U 1245, 0000,003C,ED80,0800,0084,7246
U 1246, 0000,003C,0580,0800,0084,9247
U 1247, 0803,0010,0180,0800,0000,1248
U 1248, 001D,2024,01C0,09E8,0000,1249
U 1249, 0800,003C,0180,0A38,0000,124A
U 124A, 001D,2000,0180,0800,0010,124B
U 124B, 0001,013C,0180,09F0,0000,10A8
U 10A8, 0000,003D,0180,0800,0000,118A

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U 10A9.	0000,003C,0180,0A08,0200,124C	:2367	VA R[1]	
U 124C.	0000,003C,0180,09E0,0000,124D	:2368	RC[0C] LA	
U 124D.	0000,003C,0180,0A20,0082,124E	:2369	SC R[4]	
U 124E.	0000,003C,01C0,0A68,0000,124F	:2370	Q R[0D]	
U 124F.	0001,2034,01C0,0A60,0000,10AA	:2371	A[U,Q,AND,MASK,Q,ALU,LAB,R[0C]	
U 10AA.	001C,0031,01C0,0AB0,0000,101A	:2372	ALU_LA[OR]Q,Q_ALD,R[6]_ACU,CALL,J/RELSUB ; SIMULATE TRANSLATION	=0
U 10AB.	0000,003C,01C0,0A30,0000,1250	:2373	Q R[6]	
U 1250.	0001,203C,0180,09D8,0000,10AC	:2374	RC[0B] Q	
U 10AC.	0001,203D,0180,0AC0,0000,100C	:2375	R[8] Q,CALL,J/TBWR1 ; WRITE GROUP 1	=0
U 10AD.	0000,003C,0180,6000,0000,1251	:2376	FS/MCT,MCT/READ.V.NEWPC ; LOAD IPA	
U 1251.	0010,0038,0180,0920,0200,1252	:2377	VA R[4]	
U 1252.	0000,003C,0180,F800,0000,1253	:2378	FS7MCT,MCT/ALLOW.IB.READ ; CHANGE VA TO CATCH BAD MUX SELECTS	
U 1253.	0000,003C,69F0,2C00,0000,1254	:2379	Q ID[TIME.ADDR]	
U 1254.	0000,003C,ED80,0800,0084,7255	:2380	SC_K[.1B]	
U 1255.	0000,003C,0580,0800,0084,9256	:2381	SC-SC+K[.1]	
U 1256.	0803,0010,0180,0800,0000,1257	:2382	ALD_MASK+1,D,ALU	
U 1257.	001D,2024,01C0,09E8,0000,1258	:2383	ALU-Q[ANDNOT]D,Q_ALU,RC[0D]_ALU	
U 1258.	0800,003C,0180,0A38,0000,1259	:2384	D R[7]	
U 1259.	001D,2000,0180,0800,0010,125A	:2385	A[U,Q-D,CLK,UBCC	
U 125A.	0001,013C,0180,09F0,0000,10AE	:2386	Z?,RC[0E]_D	
U 10AE.	0000,003D,0180,0800,0000,118A	:2387	ERROR1 ; TOAR INCORRECT	=0
		:2388	; SEE IF GROUP 0 IS INTACT.	
U 10AF.	0018,0038,D580,09F8,0000,125B	:2389	RC[0F] K[.6]	
U 125B.	0010,0038,0180,0920,0200,125C	:2390	VA R[4]	
U 125C.	0010,0038,0180,09D0,0000,125D	:2391	RC[0A] LC	
U 125D.	0000,003C,0180,0928,0000,1040	:2392	LC R[5]	
U 1040.	0010,0039,0180,0AB8,0000,11BD	:2393	R[7] LC,CALL,J/HITO	=000
U 1041.	0000,003D,0180,0800,0000,118A	:2394	ERROR1 ; NON-TB MISS TRAP OCCURRED	
U 1042.	0000,003D,0180,0800,0000,118A	:2395	ERROR1 ; TB MISS TRAP OCCURRED	
U 1043.	0000,003D,0180,0800,0000,118A	:2396	ERROR1 ; HIT MISS BITS IN TBERO INCORRECT	
U 1044.	0000,0C3D,0180,0800,0000,11A2	:2397	CALL,J/RELCHK	
U 1045.	0000,003D,0180,0800,0000,118A	:2398	ERROR1 ; UTRAP OCCURRED	
U 1046.	0000,003D,0180,0800,0000,118A	:2399	ERROR1 ; IPA MUX FAILED (TOAR INCORRECT)	
U 1047.	0000,003C,0180,0A20,0010,125E	:2400	ALU_R[4],CLK,UBCC ; DONE YET?	
U 125E.	0000,013C,0180,0800,0000,10B0	:2401	Z?	
U 10B0.	0018,0000,0580,0AA0,0000,10A1	:2402	R[4]_LA-K[.1],J/H1PIBB	=0
U 10B1.	0000,003C,0180,0800,0000,10B2	:2403	NOP	

:2404
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U 10B2, 0000,003D,0180,0800,0000,105B
U 10B3, 0018,0038,5D80,09F8,0000,10B4
U 10B4, 0000,003D,0180,0800,0000,1193
U 10B5, 0000,003C,0180,0800,0000,10B6
U 10B6, 0F00,003D,0180,0800,0000,100A
U 10B7, 0001,003C,0180,0AF0,0000,10B8
U 10B8, 0000,003D,0180,0800,0000,11E7
U 10B9, 0000,003C,D980,0800,0084,725F
U 125F, 0003,001C,0180,0A80,0000,1260
U 1260, 0018,0038,5580,0A98,0000,1261
U 1261, 0003,003C,0180,0AD0,0000,1262
U 1262, 0018,0038,2180,0AA0,0000,10BA
U 10BA, 0000,003D,0180,0800,0000,1189
U 10BB, 0800,003C,0180,0A50,0000,1263
U 1263, 0010,0038,01C0,0908,0000,1264
U 1264, 001D,003C,0180,0800,0200,1265
U 1265, 0000,003C,0180,0900,0000,10BC
U 10BC, 0010,0039,0180,0AC0,0000,1018
U 10BD, 0000,003C,0180,0A20,0082,1266
U 1266, 0000,003C,01C0,0A60,0000,1267
U 1267, 0001,201C,01C0,0AB0,0000,1268
U 1268, 0800,003C,0180,0A50,0000,1269
U 1269, 0010,0038,01C0,0938,0000,126A
U 126A, 081D,0030,0180,09D0,0200,126B
U 126B, 0001,003C,0180,0AA8,0000,10BE
U 10BE, 0000,003D,0180,0800,0000,101A
U 10BF, 0000,003C,01C0,0A30,0000,126C
U 126C, 0001,203C,0180,09C0,0000,126D

.PAGE "TEST B4 TB GROUP 0 PTE MEMORY STATIC TEST"

++
TEST B4 GROUP 0 PTE MEMORY STATIC TEST
TEST DESCRIPTION
THIS IS A STATIC TEST OF THE TB PTE ADDRESS MEMORY.
A 1 IS FLOATED ACCROSS A FIELD OF 0'S THROUGH THE ADDRESS
PORTION OF THE PTE STORED IN EACH OF THE 64 TB MEMORY LOCATIONS
IN GROUP 0.
LOGIC DESCRIPTION
ERROR DESCRIPTION
EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
ACTUAL TBER0
EXPECTED TIME OUT ADDRESS REGISTER
ACTUAL TIME OUT ADDRESS REGISTER
VA WRITTEN
UTRAP FLAG
PTE WRITTEN
SYNC POINT DESCRIPTION
--

=0
TMEGO: NEWTST
RC[0F] K[.7]
=0 CALL,J7CSOFF ; TURN OFF CACHE AND SBI
NOP
=0 D 0,CALL,J/DC.DE
RC[0E] D
=0 CALL,J/TBWPTP ; GENERATE TEST PATTERNS
SC K[.9]
ALU NOT.MASK,R[0]_ALU
R[3] K[.3F] ; SET ADDRESS LOOP COUNTER
R[0A] 0
TMEGOA: R[4] R[.14] ; SET BIT LOOP COUNTER
=0 ERLOOP
TMEGOB: D_R[0A]
Q-R[0A]
ACU D[OR]Q,VA_ALU
LC R[0A]
=0 R[8] LC,CALL,J/TBWRB ; WRITE BOTH GROUPS
SC R[4]
Q R[0C]
ACU Q.ORNOT.MASK,Q_ALU,R[6]_ALU
D_R[0A]
Q-R[0A]
ACU D[OR]Q,VA_ALU,RC[0A]_ALU,D_ALU
R[5] D
=0 CALL,J/RELSUB ; SIMULATE TRANSLATION
Q R[6]
R[8] Q

U 126D.	0001,203C,0180,0AC0,0000,10C0	:2459	R[8],Q	
U 10C0.	0000,003D,0180,0800,0000,1014	:2460	CALL,J/TBWRO	: WRITE GROUP 0
U 10C1.	0000,003C,0180,0800,0000,1050	:2461	NOP	
U 1050.	0000,003D,0180,0800,0000,11BD	:2462	CALL,J/HITO	: SEE IF HIT IN GROUP 0
U 1051.	0000,003D,0180,0800,0000,118A	:2463	ERROR1	: NON TB MISS TRAP OCCURRED
U 1052.	0000,003D,0180,0800,0000,118A	:2464	ERROR1	: TB MISS TRAP OCCURRED
U 1053.	0000,003D,0180,0800,0000,118A	:2465	ERROR1	: HIT MISS BITS IN TBERO INCORRECT
U 1054.	0000,003D,0180,0800,0000,11A2	:2466	CALL,J/RELCHK	
U 1055.	0000,003D,0180,0800,0000,118A	:2467	ERROR1	: UTRAP OCCURRED
U 1056.	0000,003D,0180,0800,0000,118A	:2468	ERROR1	: TB GROUP 0 DATA INCORRECT
U 1057.	0000,003C,0180,0A20,0010,126E	:2469	ALU_R[4],CLK.UBCC	: DONE ALL BITS AT THIS ADDRESS YET
U 126E.	0000,013C,0180,0800,0000,10C2	:2470	Z?	
U 10C2.	0018,0000,0580,0AA0,0000,10BB	:2471	R[4],LA-K[.1],J/TMEGOB	
U 10C3.	0000,003C,01C0,0A00,0000,126F	:2472	Q_R[0]	
U 126F.	0800,003C,0180,0A50,0000,1270	:2473	D-R[0A]	
U 1270.	081D,0014,0180,0AD0,0000,1271	:2474	ALU_D+Q,R[0A],ALU,D_ALU	
U 1271.	0000,003C,6180,0800,0084,7272	:2475	SC_R[F]	
U 1272.	0000,003C,0580,0800,0084,B273	:2476	SC-SC-K[.1]	
U 1273.	0001,0024,0180,0800,0010,1274	:2477	ALU_D.ANDNOT.MASK,CLK.UBCC	
U 1274.	0000,013C,8D80,0800,0084,70C4	:2478	Z?,SC_K[.1F]	
U 10C4.	0003,001C,0180,0AD0,0000,10C5	:2479	ALU_NOT.MASK,R[0A],ALU	
U 10C5.	0000,003C,0180,0A18,0010,1275	:2480	ALU_R[3],CLK.UBCC	: DONE ALL ADDRESSES YET?
U 1275.	0000,013C,0180,0800,0000,10C6	:2481	Z?	
U 10C6.	0018,0000,0580,0A98,0000,1262	:2482	R[3],LA-K[.1],J/TMEGOA	
U 10C7.	0000,003C,0180,0800,0000,10C8	:2483	NOP	

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:2484 .PAGE "TEST B5 TB GROUP 1 PTE MEMORY STATIC TEST"
:2485 *****
:2486 **
:2487 TEST B5 TB GROUP 1 PTE MEMORY STATIC TEST
:2488
:2489 TEST DESCRIPTION
:2490 THIS IS A STATIC TEST OF THE TB PTE ADDRESS MEMORY.
:2491 A 1 IS FLOATED ACCROSS A FIELD OF 0'S THROUGH THE ADDRESS
:2492 PORTION OF THE PTE STORED IN EACH OF THE 64 TB MEMORY LOCATIONS
:2493 IN GROUP 1.
:2494
:2495 LOGIC DESCRIPTION
:2496
:2497 ERROR DESCRIPTION
:2498 EXPECTED TBERO (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
:2499 ACTUAL TBERO
:2500 EXPECTED TIME OUT ADDRESS REGISTER
:2501 ACTUAL TIME OUT ADDRESS REGISTER
:2502 VA WRITTEN
:2503 UTRAP FLAG
:2504 PTE WRITTEN
:2505
:2506 SYNC POINT DESCRIPTION
:2507
:2508 --
:2509 *****
:2510 =0
:2511 TMEG1: NEWTST
:2512 RC[0F] K[.7]
:2513 =0 CALL,J7CSOFF ; TURN OFF CACHE AND SBI
:2514 NOP
:2515 =0 D 0,CALL,J/DC.DE
:2516 RC[0E] D
:2517 =0 CALL,J/TBWPTP ; GENERATE TEST PATTERNS
:2518 SC K[.9]
:2519 ALU NOT.MASK,R[0]_ALU
:2520 R[3] K[.3F] ; SET ADDRESS LOOP COUNTER
:2521 R[0A] 0
:2522 TMEG1A: R[4] R[.14] ; SET BIT LOOP COUNTER
:2523 =0 ERLOOP
:2524 TMEG1B: D R[0A]
:2525 Q R[0C]
:2526 ACU D[OR]Q,VA_ALU
:2527 LC R[0C]
:2528 =0 R[8] LC,CALL,J/TBWRB ; WRITE BOTH GROUPS
:2529 SC R[4]
:2530 Q R[0C]
:2531 ACU Q.ORNOT.MASK,Q_ALU,R[6]_ALU
:2532 D R[0A]
:2533 Q R[0C]
:2534 ACU D[OR]Q,VA_ALU,D_ALU,R[0A]_ALU
:2535 R[5] D
:2536 =0 CALL,J/RELSUB ; SIMULATE RELOCATION
:2537 Q R[6]
:2538 R[8] 0
  
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U 10C8. 0000.003D.0180.0800.0000.105B
U 10C9. 0018.0038.5D80.09F8.0000.10CA
U 10CA. 0000.003D.0180.0800.0000.1193
U 10CB. 0000.003C.0180.0800.0000.10CC
U 10CC. 0F00.003D.0180.0800.0000.100A
U 10CD. 0001.003C.0180.0AF0.0000.10CE
U 10CE. 0000.003D.0180.0800.0000.11E7
U 10CF. 0000.003C.D980.0800.0084.7276
U 1276. 0003.001C.0180.0A80.0000.1277
U 1277. 0018.0038.5580.0A98.0000.1278
U 1278. 0003.003C.0180.0AD0.0000.1279
U 1279. 0018.0038.2180.0AA0.0000.10D0
U 10D0. 0000.003D.0180.0800.0000.1189
U 10D1. 0800.003C.0180.0A50.0000.127A
U 127A. 0010.0038.01C0.0908.0000.127B
U 127B. 001D.003C.0180.0800.0200.127C
U 127C. 0000.003C.0180.0900.0000.10D2
U 10D2. 0010.0039.0180.0AC0.0000.1018
U 10D3. 0000.003C.0180.0A20.0082.127D
U 127D. 0000.003C.01C0.0A60.0000.127E
U 127E. 0001.201C.01C0.0AB0.0000.127F
U 127F. 0800.003C.0180.0A50.0000.1280
U 1280. 0010.0038.01C0.0438.0000.1281
U 1281. 081D.0030.0180.09D0.0200.1282
U 1282. 0001.003C.0180.0AA8.0000.10D4
U 10D4. 0000.003D.0180.0800.0000.101A
U 10D5. 0000.003C.01C0.0A30.0000.1283
U 1283. 0001.203C.0180.09C0.0000.1284
  
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Address	Hex Data	Assembly	Comments
U 1284	0001,203C,0180,0A00,0000,10D6	:2539 R[8]_Q	
U 10D6	0000,003D,0180,0800,0000,100C	:2540 CALL,J/TBWR1	; WRITE GROUP 1
U 10D7	0000,003C,0180,0800,0000,1060	:2541 NOP	
U 1060	0000,003D,0180,0800,0000,11CA	:2542 =000 CALL,J/HIT1	; SEE IF HIT IN GROUP 1
U 1061	0000,003D,0180,0800,0000,118A	:2543 ERROR1	; NON TB MISS TRAP OCCURRED
U 1062	0000,003D,0180,0800,0000,118A	:2544 ERROR1	; TB MISS TRAP OCCURRED
U 1063	0000,003D,0180,0800,0000,118A	:2545 ERROR1	; HIT MISS BITS IN TBERO INCORRECT
U 1064	0000,003D,0180,0800,0000,11A2	:2546 CALL,J/RELCHK	
U 1065	0000,003D,0180,0800,0000,118A	:2547 ERROR1	; UTRAP OCCURRED
U 1066	0000,003D,0180,0800,0000,118A	:2548 ERROR1	; TB GROUP 1 DATA MEMORY FAILED
U 1067	0000,003C,0180,0A20,0010,1285	:2549 ALU_R[4],CLK.UBCC	; DONE ALL BITS AT THIS ADDRESS YET?
U 1285	0000,013C,0180,0800,0000,10D8	:2550 Z?	
U 10D8	0018,0000,0580,0AA0,0000,10D1	:2551 =0 R[4]_LA-K[.1],J/TMEG1B	
U 10D9	0000,003C,01C0,0A00,0000,1286	:2552 Q_R[0]	
U 1286	0800,003C,0180,0A50,0000,1287	:2553 D-R[0A]	
U 1287	081D,0014,0180,0AD0,0000,1288	:2554 A[U_D+Q,R[0A]_ALU,D_ALU	
U 1288	0000,003C,0180,0800,0084,7289	:2555 SC_R[F]	
U 1289	0000,003C,0580,0800,0084,B28A	:2556 SC-SC-K[.1]	
U 128A	0001,0024,0180,0800,0010,128B	:2557 ALU_D.ANDNOT.MASK,CLK.UBCC	
U 128B	0000,013C,8D80,0800,0084,70DA	:2558 Z?,SC_K[.1F]	
U 10DA	0003,001C,0180,0AD0,0000,10DB	:2559 =0 ALU_NOT.MASK,R[0A]_ALU	
U 10DB	0000,003C,0180,0A18,0010,128C	:2560 ALU_R[3],CLK.UBCC	; DONE WITH ALL ADDRESSES YET?
U 128C	0000,013C,0180,0800,0000,10DC	:2561 Z?	
U 10DC	0018,0000,0580,0A98,0000,1279	:2562 =0 R[3]_LA-K[.1],J/TMEG1A	
U 10DD	0000,003C,0180,0800,0000,10DE	:2563 NOP	


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:2564 .PAGE "TEST B6 TB GROUP 0 TAG MEMORY STATIC TEST"
:2565 *****
:2566 ++
:2567 TEST B6 TB GROUP 0 TAG MEMORY STATIC TEST
:2568
:2569 TEST DESCRIPTION
:2570 THIS IS A TEST OF THE ADDRESS (TAG) MEMORY OF THE
:2571 TB. HERE A STATIC TEST IS PERFORMED BY FLOATING
:2572 A 1 THROUGH 0'S IN THE VA <30:14> WHICH IS
:2573 WRITTEN INTO EACH OF THE 64 LOCATIONS OF TB GROUP 0.
:2574
:2575 LOGIC DESCRIPTION
:2576
:2577 ERROR DESCRIPTION
:2578 EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
:2579 ACTUAL TBER0
:2580 EXPECTED TIME OUT ADDRESS REGISTER
:2581 ACTUAL TIME OUT ADDRESS REGISTER
:2582 VA WRITTEN
:2583 UTRAP FLAG
:2584
:2585 SYNC POINT DESCRIPTION
:2586
:2587 --
:2588 *****
:2589 =0
:2590 TBADGO: NEWTST
:2591 RC[0F] K[.6]
:2592 =0 CALL,J7CSOFF ; TURN OFF CACHE AND SBI
:2593 NOP
:2594 =0 D 0,CALL,J/DC.DE
:2595 R[0E] D
:2596 =0 CALL,J/TBWPTP ; GENERATE TEST PATTERNS
:2597 R[1] 0
:2598 D K[.F]
:2599 ACU D-K[.1],R[9]_ALU
:2600 SC R[.9]
:2601 ALU NOT.MASK,R[0]_ALU
:2602 R[3] K[.3F] ; SET ADDRESS COUNTER
:2603 TAFGOA: R[4] K[.10] ; SET BIT LOOP COUNTER
:2604 =0 ERLOOP
:2605 TAFGOB: D R[1]
:2606 Q-R[7]
:2607 ACU D[OR]Q,VA_ALU
:2608 LC R[6]
:2609 =0 R[8] LC,CALL,J/TBWRB ; WRITE BOTH GROUPS
:2610 D R[4]
:2611 LAB R[9]
:2612 ALU LA[A+B]D,SC_ALU
:2613 D R[1]
:2614 ACU D,ORNOT.MASK,VA_ALU,R[0A]_ALU
:2615 LC R[0]
:2616 R[8] LC
:2617 LC R[2]
:2618 =0 R[7] LC,CALL,J/TBWRO ; WRITE GROUP 0

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U 10DE, 0000,003D,0180,0800,0000,105B
U 10DF, 0018,0038,D580,09F8,0000,10E0
U 10E0, 0000,003D,0180,0800,0000,1193
U 10E1, 0000,003C,0180,0800,0000,10E2
U 10E2, 0F00,003D,0180,0800,0000,100A
U 10E3, 0001,003C,0180,0AF0,0000,10E4
U 10E4, 0000,003D,0180,0800,0000,11E7
U 10E5, 0003,003C,0180,0A88,0000,128D
U 128D, 0818,0038,6180,0800,0000,128E
U 128E, 0019,0000,0580,0AC8,0000,128F
U 128F, 0000,003C,D980,0800,0084,7290
U 1290, 0003,001C,0180,0A80,0000,1291
U 1291, 0018,0038,5580,0A98,0000,1292
U 1292, 0018,0038,6580,0AA0,0000,10E6
U 10E6, 0000,003D,0180,0800,0000,1189
U 10E7, 080C,003C,0180,0A08,0000,1293
U 1293, 0010,0038,01C0,0938,0000,1294
U 1294, 001D,0030,0180,0800,0200,1295
U 1295, 0000,003C,0180,0930,0000,10E8
U 10E8, 0010,0039,0180,0AC0,0000,1018
U 10E9, 0800,003C,0180,0A20,0000,1296
U 1296, 0000,003C,0180,0A48,0000,1297
U 1297, 001C,2014,0180,0800,0082,1298
U 1298, 0800,003C,0180,0A08,0000,1299
U 1299, 0001,001C,0180,09D0,0200,129A
U 129A, 0000,003C,0180,0900,0000,129B
U 129B, 0010,0038,0180,0AC0,0000,129C
U 129C, 0000,003C,0180,0910,0000,10EA
U 10EA, 0010,0039,0180,0AB8,0000,1014

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U 10EB,	0000,003C,0180,0800,0000,1068	:2619		NOP	
U 1068,	0000,003D,0180,0800,0000,118D	:2620	=000	CALL,J/HITO	: SEE IF HIT IN GROUP 0
U 1069,	0000,003D,0180,0800,0000,118A	:2621		ERROR1	: NON TB MISS TRAP OCCURRED
U 106A,	0000,003D,0180,0800,0000,118A	:2622		ERROR1	: TB MISS TRAP OCCURRED
U 106B,	0000,003D,0180,0800,0000,118A	:2623		ERROR1	: HIT MISS BITS IN TBERO INCORRECT
U 106C,	0000,003D,0180,0800,0000,11A2	:2624		CALL,J/RELCHK	
U 106D,	0000,003D,0180,0800,0000,118A	:2625		ERROR1	: UTRAP OCCURRED
U 106E,	0000,003D,0180,0800,0000,118A	:2626		ERROR1	: GROUP 0 TAG MEMORY FAILED
U 106F,	0000,003C,0180,0A20,0010,129D	:2627		ALU_R[4],CLK.UBCC	: DONE ALL BITS AT THIS ADDRESS YET?
U 129D,	0000,013C,0180,0800,0000,10EC	:2628		Z?	
U 10EC,	0018,0000,0580,0AA0,0000,10E7	:2629	=0	R[4]_LA-K[.1],J/TAFGOB	
U 10ED,	0000,003C,01C0,0A00,0000,129E	:2630		Q_R[0]	
U 129E,	0800,003C,0180,0A08,0000,129F	:2631		D_R[1]	
U 129F,	081D,2014,0180,0A88,0000,12A0	:2632		ALU_Q+D,R[1]_ALU,D_ALU	
U 12A0,	0000,003C,6180,0800,0084,72A1	:2633		SC_R[F]	
U 12A1,	0000,003C,0580,0800,0084,82A2	:2634		SC-SC-K[.1]	
U 12A2,	0001,0024,0180,0800,0010,12A3	:2635		ALU_D.ANDNOT.MASK,CLK.UBCC	
U 12A3,	0000,013C,8D80,0800,0084,70EE	:2636		Z?,SC_K[.1F]	
U 10EE,	0003,001C,0180,0A88,0000,10EF	:2637	=0	ALU_NOT.MASK,R[1]_ALU	
U 10EF,	0000,003C,0180,0A18,0010,12A4	:2638		ALU_R[3],CLK.UBCC	: DONE ALL ADDRESSES YET?
U 12A4,	0000,013C,0180,0800,0000,10F0	:2639		Z?	
U 10F0,	0018,0000,0580,0A98,0000,1292	:2640	=0	R[3]_LA-K[.1],J/TAFGOA	
U 10F1,	0000,003C,0180,0800,0000,10F2	:2641		NOP	

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U 10F2, 0000,003D,0180,0800,0000,105B
U 10F3, 0018,0038,D580,09F8,0000,10F4
U 10F4, 0000,003D,0180,0800,0000,1193
U 10F5, 0000,003C,0180,0800,0000,10F6
U 10F6, 0F00,003D,0180,0800,0000,100A
U 10F7, 0001,003C,0180,0AF0,0000,10F8
U 10F8, 0000,003D,0180,0800,0000,11E7
U 10F9, 0003,003C,0180,0A88,0000,12A5
U 12A5, 0818,0038,6180,0800,0000,12A6
U 12A6, 0019,0000,0580,0AC8,0000,12A7
U 12A7, 0000,003C,D980,0800,0084,72A8
U 12A8, 0003,001C,0180,0A80,0000,12A9
U 12A9, 0018,0038,5580,0A98,0000,12AB
U 12AB, 0018,0038,6580,0AA0,0000,10FA
U 10FA, 0000,003D,0180,0800,0000,1189
U 10FB, 0800,003C,0180,0A08,0000,12AC
U 12AC, 0010,0038,01C0,0938,0000,12AD
U 12AD, 001D,0030,0180,0800,0200,12AE
U 12AE, 0000,003C,0180,0930,0000,10FC
U 10FC, 0010,0039,0180,0AC0,0000,1018
U 10FD, 0800,003C,0180,0A20,0000,12AF
U 12AF, 0000,003C,0180,0A48,0000,12B0
U 12B0, 001C,2014,0180,0800,0082,12B1
U 12B1, 0800,003C,0180,0A08,0000,12B2
U 12B2, 0001,001C,0180,09D0,0200,12B3
U 12B3, 0000,003C,0180,0900,0000,12B4
U 12B4, 0010,0038,0180,0AC0,0000,12B5
U 12B5, 0000,003C,0180,0910,0000,10FE
U 10FE, 0010,0039,0180,0AB8,0000,100C
    
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.PAGE 'TEST B7 TB GROUP 1 TAG MEMORY STATIC TEST'
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++
TEST B7 TB TAG MEMORY STATIC TEST

TEST DESCRIPTION
THIS IS A TEST OF THE ADDRESS (TAG) MEMORY OF THE
TB. HERE A STATIC TEST IS PERFORMED BY FLOATING
A 1 THROUGH 0'S IN THE VA <30:14> WHICH IS
WRITTEN INTO EACH OF THE 64 LOCATIONS OF TB GROUP 1.

LOGIC DESCRIPTION

ERROR DESCRIPTION
EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
ACTUAL TBER0
EXPECTED TIME OUT ADDRESS REGISTER
ACTUAL TIME OUT ADDRESS REGISTER
VA WRITTEN
UTRAP FLAG

SYNC POINT DESCRIPTION
--
*****
=0
TBADG1: NEWTST
RC[0F] K[.6]
=0 CALL,J7CSOFF ; TURN OFF CACHE,SBI
NOP
=0 D 0,CALL,J/DC.DE
RC[0E] D
=0 CALL,J/TBWPTP ; GENERATE TEST PATTERNS
RC[1] 0
D K[.F]
ACU D-K[.1],R[9]_ALU
SC R[.9]
ALD NOT.MASK,R[0]_ALU
R[3] K[.3F] ; SET ADDRESS LOOP COUNTER
TAFG1A: R[4] K[.10] ; SET BIT LOOP CGUNTER
=0 ERLOOP
TAFG1B: D R[1]
Q-R[7]
ACU D[OR]0,VA_ALU
LC R[6]
=0 R[8] LC,CALL,J/TBWRB ; WRITE BOTH GROUPS
D R[4]
LAB_R[9]
ALU LA[A+B]D,SC_ALU
D R[1]
ACU D,ORNOT.MASK,VA_ALU,RC[0A]_ALU
LC R[0]
R[8] LC
LC R[2]
=0 R[7] LC,CALL,J/TBWR1 ; WRITE GROUP 1
    
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[illegible]


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U 1114, 0018,0039,1180,09F8,0000,105B
U 1115, 0818,0038,65F8,0800,0084,72BF
U 12BF, 0D00,003C,0180,0800,0000,12C0
U 12C0, 0000,003C,4980,3C00,0000,12C1
U 12C1, 0818,0038,C180,0800,0000,12C2
U 12C2, 0500,003C,8980,0800,0084,72C3
U 12C3, 0819,0030,05F8,0800,0084,92C4
U 12C4, 0D00,003C,D980,0800,0084,72C5
U 12C5, 0801,001C,0180,0800,0000,12C6
U 12C6, 0001,003C,0180,09F0,0000,12C7
U 12C7, 0003,003C,0180,0A80,0000,12C8
U 12C8, 0818,0038,8D80,0800,0000,12C9
U 12C9, 0D00,003C,0180,0800,0000,12CA
U 12CA, 0001,003C,0180,0980,0000,12CB
U 12CB, 0018,0038,D180,09E0,0000,1116
U 1116, 0000,003D,0180,0800,0000,1189
U 1117, 0000,003C,0180,0A00,0200,12CC
U 12CC, 0000,003C,8D80,0800,0084,72CD

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.PAGE 'TEST B8 DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS M
*****
++
TEST B8 DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS MATRIX
TEST DESCRIPTION
THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES TO THE
TRANSLATION BUFFER ADDRESS MATRIX. THIS IS DONE WITH THE
FOLLOWING SEQUENCE:
1) VALIDATE ADDRESS 0          3) VALIDATE ADDRESS 400
   VALIDATE ADDRESS 7FFFC200    VALIDATE ADDRESS 7FFFC800
   CHECK ADDRESS 0 FOR VALID    CHECK ADDRESS 400 FOR VALID
2) VALIDATE ADDRESS 200        CHECK ADDRESS 200 FOR VALID
   VALIDATE ADDRESS 7FFFC400    CHECK ADDRESS 0 FOR VALID
   CHECK ADDRESS 200 FOR VALID  4) ETC...
   CHECK ADDRESS 0 FOR VALID
THE WRITE BOTH BIT IS SET IN TBERO SO THAT BOTH GROUPS CAN BE
CHECKED AT THE SAME TIME.
LOGIC DESCRIPTION
THIS TEST CHECKS TRANSLATION BUFFER TAG MEMORY ON THE CAM MODULE.
ERROR DESCRIPTION
DATA: ADDRESS VALIDATED AS ONE'S (7FFFC200, 7FFFC400, ETC.)
      ADDRESS BEING CHECK FOR ZERO'S (0,200,400,800,1000, ETC.)
      EXPECTED TB HIT/MISS BITS
      RECEIVED TB HIT/MISS BITS
--
*****
=0
T004: NEWTST[.4]
      D_K[.10],SC_K[.10],Q_0      : GENERATE DATA FOR TBERO
      D-DAL.SC                    : WRITE BOTH BIT
      ID[TBERO] D                  : LOAD THE TBERO REGISTER
      D_K[.FFFF]                  : GENERATE THE INITIAL ADDRESS
      D-D.LEFT,SC_K[.D]            : THAT GETS WRITTEN WITH ALL
      D-D.OR.K[.1],SC_SC+K[.1].Q_0 : ONE'S
      D-DAL.SC,SC_K[.9]
      D-D.ORNOT.MASK
      R[OE] D                      : EQUALS 7FFFFFFC200
      R[0] 0                      : INIT ADDRESS THAT GETS WRITTEN AS ZERO'S
      D_K[.1F]                    : GENERATE MASK FOR TAG BITS
      D-DAL.SC                    : EQUALS 3E00
      R[0] D                      : SET EXPECTED HIT/MISS BITS
      R[OC]_K[.C0]
      ERLOOP
LOOPM: VA_ALU,ALU_R[0]            : LOAD ADDRESS TO WRITE ZERO'S
      SC_K[.1F]

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U 12CD, 0803,001C,0180,0800,0000,12CE :2776      D NOT.MASK      ; GET PTE VALID BIT
U 12CE, 0000,003C,4180,3C00,0000,12CF :2777      ID[IBUF] D      ; LOAD THE TB
U 12CF, 0010,0038,0180,0970,0200,12D0 :2778      VA ALU,A[U RC[OE] ; LOAD ADDRESS TO WRITE ALL ONE'S
U 12D0, 0010,0038,41C0,3D70,0000,12D1 :2779      Q_RC[OE],ID[IBUF]_D ; LOAD THE TB
                                     :2780      ; GET FIRST ADDRESS WITH ALL ZERO'S
U 12D1, 0011,2034,01C0,0900,0010,12D2 :2781      Q Q.AND.RC[0],CLK.UBCC ; IS BIT 31 SET?
U 12D2, 0000,013C,0180,0800,0000,1118 :2782      Z?          ; BRANCH IF YES
U 1118, 0000,003C,0180,0800,0000,12D4 :2783      =0          ; CONTINUE
U 1119, 0000,003C,8980,0800,0084,72D3 :2784      SC_K[D]      ; FIRST ADDRESS HAS BIT 13 SET
U 12D3, 0003,001C,8DC0,0800,0034,72D5 :2785      Q NOT.MASK,SC_K[.1F],J/NOSHIFT ; SET BIT 13 AND CONTINUE
U 12D4, 0000,003C,0180,0800,0000,12D5 :2786      LOOPN: Q_Q.RIGHT
U 12D5, 0011,2034,01C0,0900,0200,12D6 :2787      NOSHIFT: Q_Q.AND.RC[0],VA_ALU ; LOAD THE ADDRESS
U 12D6, 0001,203C,0180,09E8,0000,12D7 :2788      RC[OD] Q      ; SAVE IT
U 12D7, 0000,003C,49F0,2C00,0000,12D8 :2789      Q_ID[IBERO]    ; READ THE HIT/MISS BITS
U 12D8, 0011,2034,01C0,0960,0000,12D9 :2790      Q_Q.AND.RC[OC] ; MASK THEM
U 12D9, 0011,2000,0180,0800,0010,12DA :2791      A[U_Q-LE,CLK.UBCC ; CHECK FOR HIT IN BOTH GROUPS
U 12DA, 0000,013C,0180,0800,0000,111A :2792      Z?          ; DID NOT GET HIT IN BOTH GROUPS
U 111A, 0001,203D,0180,09D8,0000,118C :2793      =0          ; MORE ADDRESSES TO CHECK?
U 111B, 0010,0038,01C0,0968,0010,12DB :2794      Q_RC[OD],CLK.UBCC
U 12DB, 0000,013C,0180,0800,0000,111C :2795      Z?          ; YES
U 111C, 0000,003C,0180,0800,0000,12D4 :2796      =0          ; IS BIT 31 SET IN ADR WITH ALL ONE'S?
U 111D, 0810,0038,0180,0970,0010,12DC :2797      D RC[OE],CLK.UBCC
U 12DC, 0000,1B3C,0180,0800,0000,1017 :2798      A[U.N?
U 1017, 0000,003C,0180,0800,0000,12DD :2799      =0111      J/NEXTADDRESS ; BIT 31 NOT SET YET
U 101F, 0000,003C,0180,0800,0000,12E3 :2800      J/ENDT004      ; DONE WITH TEST
                                     :2801      NEXTADDRESS:
U 12DD, 0811,0034,0180,0900,0000,12DE :2802      D D[AND]RC[0]    ; GET TAG FIELD OF ADDRESS WITH ALL ONE'S
U 12DE, 0501,003C,0180,0A80,0000,12DF :2803      R[0] D,D D.LEFT ; SET NE ADDRESS TO WRITE ALL ZERO'S
U 12DF, 0011,0034,0180,0900,0010,12E0 :2804      ALU D[AND]RC[0],CLK.UBCC ; TIME TO SET BIT 31?
U 12E0, 0010,0138,01C0,0970,0000,111E :2805      Z?,Q RC[OE]
U 111E, 0000,003C,0180,0800,0000,12E1 :2806      =0          ; GET BIT 31
U 111F, 0803,001C,0180,0800,0000,12E1 :2807      D NOT.MASK
                                     :2808      NOTBIT31:
U 12E1, 0011,2024,01C0,0900,0000,12E2 :2809      Q Q.ANDNOT.RC[0] ; GET THE ALL ONE'S
U 12E2, 001D,0030,0180,09F0,0000,1117 :2810      RC[OE]_D.OR.Q,J/LOOPM ; CONTINUE TEST
U 12E3, 0000,003C,0180,0800,0000,1120 :2811      ENDT004:NOP
    
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U 1120.	0018,0039,1180,09F8,0000,105B
U 1121.	0818,0038,8D80,0800,0000,12E4
U 12E4.	0000,003C,D9F8,0800,0084,72E5
U 12E5.	0D00,003C,0180,0800,0000,12E6
U 12E6.	0001,003C,0180,0980,0000,1122


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U 1122, 0000,003D,018C,0800,0000,118E :2867 =0 SUBTEST
U 1123, 0818,0038,0980,0800,0000,12E7 :2868 D_K[.2]
U 12E7, 0000,003C,01F8,0800,0084,72E8 :2869 SC_K[.8],Q_0
U 12E8, 0D00,003C,0180,0800,0000,12E9 :2870 D_DAL.SC
U 12E9, 0001,003C,1180,09F0,0084,72EA :2871 RC[OE] D,SC_K[.4]
U 12EA, 0003,003C,0580,0A80,0084,92EB :2872 RC[0] 0,SC_K[.1]
U 12EB, 0818,0038,0180,0800,0000,12EC :2873 D_K[FFFF]
U 12EC, 0D00,003C,8D80,0800,0084,72ED :2874 D_DAL.SC,SC_K[.1F]
U 12ED, 0801,001C,0180,0800,0000,12EE :2875 D_D.ORN0T.MASK
U 12EE, 0019,0030,4980,0A88,0000,12EF :2876 RC[1] D.OR.K[.FF]
U 12EF, 0818,0038,8980,0800,0000,12F0 :2877 D_K[.19]
U 12F0, 0819,0000,0D80,0800,0000,12F1 :2878 D_D-K[.3]
U 12F1, 0000,003C,65F8,0800,0084,72F2 :2879 SC_K[.10],Q_0
U 12F2, 0D00,003C,0180,0800,0000,12F3 :2880 D_DAL.SC
U 12F3, 0819,0030,0580,0800,0000,12F4 :2881 D_D.OR.K[.1]
U 12F4, 0000,003C,4980,3C00,0000,12F5 :2882 ID[TBER0]_D
U 12F5, 0003,003C,0180,09E0,0000,1124 :2883 RC[OC]_0
U 1124, 0000,003D,0180,0800,0000,1189 :2884 =0 ERLOOP
U 1125, 0000,003C,0180,0A00,0200,12F6 :2885 LOOP0: VA_ALU,ALU_RC[0]
U 12F6, 0000,003C,8D80,0800,0084,72F7 :2886 SC_K[.1F]
U 12F7, 0803,001C,0180,0800,0000,12F8 :2887 D_NOT.MASK
U 12F8, 0000,003C,4180,3C00,0000,12F9 :2888 ID[IBUF]_D
U 12F9, 0010,0038,0180,0970,0200,12FA :2889 VA_ALU,ALU_RC[OE]
U 12FA, 0800,003C,0180,0A08,0000,12FB :2890 D_RC[1]
U 12FB, 0010,0038,41C0,3D70,0000,12FC :2891 Q_RC[OE],ID[IBUF]_D
U 12FC, 0011,2034,01C0,0900,0010,12FD :2892 Q_Q.AND.RC[0],CLK_UBCC
U 12FD, 0000,013C,0180,0800,0000,1126 :2893 Z?
U 1126, 0000,003C,0180,0800,0000,12FF :2894 =0 J/LOOPP
U 1127, 0000,003C,8980,0800,0084,72FE :2895 SC_K[.D]
U 12FE, 0003,001C,8DC0,0800,0084,7300 :2896 Q_NOT.MASK,SC_K[.1F],J/NOSHIFT1
U 12FF, 0000,003C,0180,0800,0000,1300 :2897 LOOPP: Q_Q.RIGHT
:2898 NOSHIFT1:
U 1300, 0011,2034,01C0,0900,0200,1301 :2899 Q_Q.AND.RC[0],VA_ALU
U 1301, 0001,203C,0180,09E8,0000,1302 :2900 RC[OD]_Q
U 1302, 0000,003C,69F0,2C00,0000,1303 :2901 Q_ID[TIME.ADDR]
U 1303, 0001,203C,0180,0800,0010,1304 :2902 ALU_Q,CLK_UBCC
U 1304, 0000,013C,0180,0800,0000,1128 :2903 Z?
U 1128, 0001,203D,0180,09D8,0000,118C :2904 =0 ERROR2,RC[OB]_Q
U 1129, 0010,0038,01C0,0968,0010,1305 :2905 Q_RC[OD],CLK_UBCC
U 1305, 0000,013C,0180,0800,0000,112A :2906 Z?
U 112A, 0000,003C,0180,0800,0000,12FF :2907 =0 J/LOOPP
U 112B, 0810,0038,0180,0970,0010,1306 :2908 D_RC[OE],CLK_UBCC
U 1306, 0000,183C,0180,0800,0000,1027 :2909 ALU_N?
U 1027, 0000,003C,0180,0800,0000,1307 :2910 =0111 J/NEXTADR1
U 102F, 0000,003C,0180,0800,0000,112E :2911 J/T005S2
:2912 NEXTADR1:
U 1307, 0501,003C,0180,0A80,0000,1308 :2913 RC[0] D,D D.LEFT
U 1308, 0811,0034,0180,0900,0010,1309 :2914 D_D[AND]RC[0],CLK_UBCC
U 1309, 0000,013C,0180,0800,0000,112C :2915 Z?
U 112C, 0000,003C,0180,0800,0000,130A :2916 =0 J/NOBIT31A
U 112D, 0803,001C,0180,0800,0000,130A :2917 D_NOT.MASK
:2918 NOBIT31A:
U 130A, 0001,003C,0180,09F0,0000,1125 :2919 RC[OE] D,J/LOOP0
:2920 :////////////////////////
:2921 :+
    
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: GENERATE INITIAL ADDRESS
: TO WRITE A PTE OF ALL ONE'S

: EQUALS 200
: SET ADDRESS TO WRITE A PTE OF ZERO'S
: GENERATE THE PTE OF ALL ONE'S

: INSERT THE VALID BIT
: PTE EQUALS 801FFFFF
: GENERATE DATA FOR TBERO TO FORCE
: MISS G1 AND FORCE REPLACE GO
: AND THE WRITE BOTH BIT

: LOAD THE REGISTER
: SET THE EXPECTED PTE

: LOAD ADR TO WRITE ZERO'S

: GET PTE
: LOAD THE PTE
: LOAD ADDRESS TO WRITE ALL ONE'S
: GET THE PTE
: LOAD THE PTE
: IS BIT 31 SET?

: BRANCH IF NO
: ADDRESS OF ZERO'S IS 2000

: LOAD ADR OF PTE OF ZERO'S
: SAVE IT
: READ THE PTE
: IS IT ZERO?

: PTE IS INCORRECT
: MORE ADDRESSES TO CHECK?

: YES
: IS BIT 31 SET IN ADR OF ONE'S?

: END SUBTEST

: SET ADR TO WRITE ZERO'S
: TIME FOR BIT31?

: SET NEW ADR TO WRITE ONE'S
    
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:2922 : NOW CHECK GROUP 1
:2923 :
:2924 =0
:2925 T005S2: SUBTEST
:2926 D_K[.2]
:2927 SC_K[.8],Q_0
:2928 D_DAL.SC
:2929 RC[OE]_D,SC_K[.4]
:2930 RC[0]_0,SC_SC+K[.1]
:2931 D_K[.19]
:2932 SC_K[.10],Q_0
:2933 D_DAL.SC
:2934 D_D.OR.K[.1]
:2935 ID[TBERO]_D
:2936 RC[OC]_0
:2937 =0
:2938 LOOPQ: VA_ALU,ALU_RC[0]
:2939 SC_K[.1F]
:2940 D_NOT.MASK
:2941 ID[TBUFF]_D
:2942 VA_ALU,ALU_RC[OE]
:2943 D_RC[1]
:2944 Q_RC[OE],ID[TBUFF]_D
:2945 Q_Q.AND.RC[0],CLK_UBCC
:2946 Z?
:2947 =0
:2948 J/LOOPR
:2949 SC_K[.D]
:2950 Q_NOT.MASK,SC_K[.1F],J/NOSHIFT2
:2951 LOOPR: Q_Q.RIGHT
:2952 NOSHIFT2:
:2953 Q_Q.AND.RC[0],VA_ALU
:2954 RC[OD]_Q
:2955 Q_ID[TIME.ADDR]
:2956 ALU_Q,CLK_UBCC
:2957 Z?
:2958 =0
:2959 ERROR2,RC[OB]_Q
:2960 Q_RC[OD],CLK_UBCC
:2961 Z?
:2962 =0
:2963 J/LOOPR
:2964 D_RC[OE],CLK_UBCC
:2965 ALU_N?
:2966 =0111
:2967 J/NEXTADR2
:2968 J/ENDT005
:2969 NEXTADR2:
:2970 RC[0]_D,D_D.LEFT
:2971 D_D[AND]RC[0],CLK_UBCC
:2972 Z?
:2973 =0
:2974 J/NOBIT31B
:2975 D_NOT.MASK
:2976 NOBIT31B:
:2977 RC[OE]_D,J/LOOPQ
:2978 ENDT005:NOP

```

: GENERATE INITIAL ADDRESS
: TO WRITE A PTE OF ALL ONE'S

: EQUALS 200
: SET ADDRESS TO WRITE A PTE OF ZERO'S
: GENERATE DATA FOR TBERO TO FORCE
: AND THE WRITE BOTH BIT

: LOAD THE REGISTER
: SET THE EXPECTED PTE

: LOAD ADR TO WRITE ZERO'S

: GET PTE
: LOAD THE PTE
: LOAD ADDRESS TO WRITE ALL ONE'S
: GET THE PTE
: LOAD THE PTE
: IS BIT 31 SET?

: BRANCH IF NO
: ADDRESS OF ZERO'S IS 2000

: LOAD ADR OF PTE OF ZERO'S
: SAVE IT
: READ THE PTE
: IS IT ZERO?

: PTE IS INCORRECT
: MORE ADDRESSES TO CHECK?

: YES
: IS BIT 31 SET IN ADR OF ONE'S?

: END TEST

: SET ADR TO WRITE ZERO'S
: TIME FOR BIT31?

: SET NEW ADR TO WRITE ONE'S

```

:2974 .PAGE "TEST BA DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY"
:2975 *****
:2976 ++
:2977 TEST BA DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY
:2978
:2979 TEST DESCRIPTION
:2980
:2981 THIS TEST PERFORMS A MOVING INVERSIONS TEST OF THE TB ADDRESS
:2982 MEMORY. MEMORY FAILURES ARE DETECTED BY A PARITY ERROR.
:2983
:2984 LOGIC DESCRIPTION
:2985
:2986 THIS TEST CHECKS THE MEMORY CHIPS OF THE TB ADDRESS MEMORY ON THE
:2987 CAM MODULE.
:2988
:2989 ERROR DESCRIPTION
:2990
:2991 DATA: ADDRESS THAT HAD A PARITY ERROR.
:2992 BACKWARD SEQUENCE FLAG (0 = FOREWARD & 1 = BACKWARD SEQUENCE)
:2993 ADDRESS INCREMENT/DECREMENT VALUE
:2994 CONTENTS OF TBER1
:2995
:2996 BY ANALYZING THE CONTENTS OF TBER1 (THE PARITY ERROR BITS) IT
:2997 SHOULD BE POSSIBLE TO DETERMINE WHICH CHIP FAILED.
:2998
:2999 --
:3000 *****
:3001 =0
:3002 T006: NEWTST[.4]
:3003
:3004 : INITIALIZE SOME FLAGS AND REGISTERS
:3005 --
:3006 SC K[.9]
:3007 D RC[1F],0 0 : GENERATE THE MASK FOR TAG BITS
:3008 D DAL.SC,SC K[1F] : <31,13:9>
:3009 RC[0] D ORNOT.MASK : SAVE IN RC[0] = 80003E00
:3010 RC[0C] K[.1] : SET THE INCREMENT/DEC VALUE
:3011 SC K[.14]
:3012 D NOT.MASK : GENERATE DATA FOR THE TBER0
:3013 D D.OR.K[.1] : REGISTER (WRITE BOTH & MME)
:3014 ID[TBER0] D : TURN ON THE TB
:3015 =0 CALL[FILLZERO] : FILL THE TAG MEMORY WITH ZERO'S
:3016 NEXTLSB: RC[0D] 0 : SET THE FOREWARD SEQ FLAG
:3017 R[2] 0 : SET DATA FLAG TO ZERO
:3018 D K[8000] 0 ALU : GENERATE THE ADDRESS THAT
:3019 D D.SWAP,R[4] 0 : WRITES ONE'S
:3020 R[3] D.OR.0 : EQUALS 00808000 (2 CHIPS)
:3021
:3022 : NOW START THE FOREWARD SEQUENCE
:3023 READ THE LOCATION
:3024 WRITE THE COMPLIMENT BIT
:3025 READ THE LOCATION
:3026
:3027 RC[3] K[.8] : SET THE LOOP COUNT FOR THE NUMBER
:3028 : OF BITS PER CHIP

```

U 113A, 0018,0039,1180,09F8,0000,105B

U 113B, 0000,003C,D980,0800,0084,732B

U 132B, 0818,0038,8DF8,0800,0000,132C

U 132C, 0D00,003C,8D80,0800,0084,732D

U 132D, 0001,001C,0180,0980,0000,132E

U 132E, 0018,0038,0580,09E0,0000,132F

U 132F, 0000,003C,2180,0800,0084,7330

U 1330, 0803,001C,0180,0800,0000,1331

U 1331, 0819,0030,0580,0800,0000,1332

U 1332, 0000,003C,4980,3C00,0000,113C

U 113C, 0000,003D,0180,0800,0000,1202

U 113D, 0003,003C,0180,09E8,0000,1333

U 1333, 0003,003C,0180,0A90,0000,1334

U 1334, 0818,0038,45C0,0800,0000,1335

U 1335, 0803,003C,0180,0AA0,0000,1336

U 1336, 001D,0030,0180,0A98,0000,1337

U 1337, 0018,0038,0180,0998,0000,1338

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U 1338, 0018,0038,3180,0990,0000,1339 :3029 LOOPBITS:
:3030 RC[02]_K[.40] ; SET THE LOOP COUNT FOR THE NUMBER
:3031 ; OF ADDRESSES PER CHIP
:3032 LOOPADDRESS:
U 1339, 0000,003C,5D80,0800,0084,733A :3033 SC_K[.7] ; SET THE PARITY ERROR MICRO
U 133A, 0003,001C,8D80,0AF8,0084,733B :3034 R[0F] NOT.MASK,SC_K[.1F] ; TRAP FLAG
U 133B, 0800,003C,0180,0A18,0200,133C :3035 VA_ALU,ALU_R[3],D_ALU ; READ THE LOCATION OF ZERO'S
U 133C, 0000,003C,0180,0000,0000,133D :3036 MCT/TEST,RCHK ; PARITY ERROR?
U 133D, 0000,003C,0180,0A78,0010,133F :3037 ALU_R[0F],CLK_UBCC ; SHOULD BE NON ZERO
U 133E, 0000,013C,4DF0,2C00,0000,113E :3038 Z?,Q_ID[TRBER1] ; BRANCH IF TRAP OCCURRED
U 113E, 0000,003C,0180,0800,0000,133F :3039 =0 J/READOK
U 113F, 0001,203C,5D80,09D8,0084,7140 :3040 SC_K[.7],RC[0B]_Q
U 1140, 0001,003D,0180,09F0,0000,118C :3041 =0 ERROR2,RC[0E]_D ; PARITY ERROR ON READ
U 1141, 0003,001C,8D80,0AF8,0084,733F :3042 R[0F] NOT.MASK,SC_K[.1F]
:3043 ;+
:3044 ; THE READ WAS OK, NOW WRITE THE COMPLIMENT BIT
:3045 ;-
:3046 READOK:
U 133F, 0000,003C,01C0,0A18,0200,1340 :3047 VA_ALU,ALU_R[3],Q_ALU ; LOAD THE ADDRESS OF ONE'S
U 1340, 0803,001C,0180,0800,0000,1341 :3048 D NOT.MASK ; MAKE IT A VALID PTE
U 1341, 0000,003C,4180,3C00,0000,1342 :3049 ID[TRBUF]_D ; WRITE THE MEMORY
U 1342, 0C00,003C,0180,0000,0000,1343 :3050 MCT/TEST,RCHK,D_Q ; READ AND CHECK FOR PARITY ERROR
U 1343, 0000,003C,0180,0A78,0010,1344 :3051 ALU_R[0F],CLK_UBCC ; SHOULD BE NON-ZERO
U 1344, 0000,013C,4DF0,2C00,0000,1142 :3052 Z?,Q_ID[TRBER1]
U 1142, 0000,003C,0180,0800,0000,1345 :3053 =0 J/READCOMPOK ; READ OF COMPLIMENT PATTERN OK
U 1143, 0001,203C,5D80,09D8,0084,7144 :3054 SC_K[.7],RC[0B]_Q
U 1144, 0001,003D,0180,09F0,0000,118C :3055 =0 ERROR2,RC[0E]_D ; PARITY ERROR OF READ ON COMPLIMENT
:3056 ; PATTERN
:3057 RC[0F] NOT.MASK,SC_K[.1F]
:3058 ;+
:3059 ; NOW CHECK IF THE FOREWARD SEQUENCE IS DONE
:3060 ;-
:3061 READCOMPOK:
U 1345, 0810,0038,0180,0910,0000,1346 :3062 D RC[2] ; GET THE ADDRESS LOOP COUNT
U 1346, 0019,0000,0580,0990,0010,1347 :3063 RC[2]_D-K[.1],CLK_UBCC
U 1347, 0000,013C,0180,0800,0000,1146 :3064 Z?
U 1146, 0000,003C,0180,0800,0000,1152 :3065 =0 J/INCDADR ; NOT DONE, GO INCRMENT THE TAG
U 1147, 0810,0038,0180,0918,0000,1348 :3066 D RC[3] ; DONE ALL THE BITS YET?
U 1348, 0019,0000,0580,0998,0010,1349 :3067 RC[3]_D-K[.1],CLK_UBCC ; BRANCH IF YES
U 1349, 0000,013C,0180,0800,0000,1148 :3068 Z?
U 1148, 0000,003C,0180,0800,0000,1156 :3069 =0 J/BITSHIFT ; GO SELECT NEXT BIT
U 1149, 0000,003C,0180,0A10,0010,134A :3070 ALU_R[2],CLK_UBCC ; DATA = 1?
U 134A, 0018,0138,0580,0A90,0000,114A :3071 Z?,RC[2]_K[.1] ; BRANCH IF NO
U 114A, 0000,003C,0180,0800,0000,1358 :3072 =0 J/BACKWARD ; SET BACKWARD SEQUENCE
U 114B, 0818,0038,5980,0800,0000,134B :3073 D_K[.7F] ; SET THE ADDRESS TO ZERO
U 134B, 0000,003C,01F8,0800,0084,734C :3074 SC_K[.8],Q_0 ; AND THE DATA BITS TO ONE'S
U 134C, 0D00,003C,0180,0800,0000,134D :3075 D_DAL.SC ; EXCEPT FOR BIT 0 (2 CHIPS)
U 134D, 0819,0030,5980,0800,0000,134E :3076 D_D.OR.K[.7F]
U 134E, 0818,0038,0180,0998,0000,134F :3077 D_D.SWAP,RC[3]_K[.8] ; SET THE BIT COUNT
U 134F, 0010,0038,0180,0968,0010,1350 :3078 ALU_R[0D],CLK_UBCC ; FOREWARD SEQ?
U 1350, 0003,013C,0180,0AA0,0000,114C :3079 Z?,RC[4]_0 ; BRANCH IF YES
U 114C, 0000,003C,0180,0800,0000,1351 :3080 =0 J/SETMAXADDRESS ; CONTINUE FOREWARD SEQUENCE
U 114D, 0001,003C,8D80,0A98,0084,7338 :3081 R[3]_D,SC_K[.1F],J/LOOPBITS
:3082 SETMAXADDRESS:
:3083 R[1]_D,SC_K[.9] ; SAVE D
    
```


U 1352. 0818.0038.8DF8.0800.0000.1353 :3084
U 1353. 0D00.003C.8D80.0800.0084.7354 :3085
U 1354. 0801.001C.0180.0800.0000.1355 :3086
U 1355. 081C.2030.0180.0A08.0000.1356 :3087
U 1356. 0018.0038.5580.0AA0.0000.1357 :3088
U 1357. 0001.003C.0180.0A98.0000.1338 :3089
:3090
U 1358. 0010.0038.0180.0968.0010.1359 :3091
U 1359. 0018.0138.0580.09E8.0000.114E :3092
U 114E. 0000.003C.0180.0800.0000.1363 :3093
U 114F. 0003.003C.0180.0A90.0000.135A :3094
U 135A. 0018.0038.0180.0998.0000.135B :3095
U 135B. 0018.0038.5580.0AA0.0000.135C :3096
U 135C. 0818.0038.8D80.0800.0000.135D :3097
U 135D. 0000.003C.D9F8.0800.0084.735E :3098
U 135E. 0D00.003C.8D80.0800.0084.735F :3099
U 135F. 0801.001C.6180.0800.0084.7360 :3100
U 1360. 0801.001C.7D80.0800.0084.7361 :3101
U 1361. 0000.003C.0580.0800.0084.8362 :3102
U 1362. 0001.001C.8D80.0A98.0084.7338 :3103
U 1363. 0810.0038.D580.0960.0084.7364 :3104
U 1364. 0500.003C.0180.0800.0000.1365 :3105
U 1365. 0001.0034.0180.09E0.0010.1366 :3106
U 1366. 0000.013C.0180.0800.0000.1150 :3107
U 1150. 0000.003C.8D80.0800.0084.713D :3108
U 1151. 0000.003C.0180.0800.0000.1370 :3109
:3110
U 1152. 0000.003D.0180.0800.0000.1212 :3111
U 1153. 0000.003C.8D80.0800.0084.7339 :3112
:3113
:3114
U 1156. 0000.003D.0180.0800.0000.1225 :3115
U 1157. 0800.003C.0180.0A18.0000.1367 :3116
U 1367. 0811.0024.0180.0900.0000.1368 :3117
U 1368. 0001.003C.0180.0A98.0000.1369 :3118
U 1369. 0010.0038.0180.0968.0010.136A :3119
U 136A. 0000.013C.D980.0800.0084.7158 :3120
U 1158. 0000.003C.0180.0800.0000.1368 :3121
U 1159. 0000.003C.8D80.0800.0084.7338 :3122
:3123
U 136B. 0818.0038.8DF8.0800.0000.136C :3124
U 136C. 0D00.003C.8D80.0800.0084.736D :3125
U 136D. 0801.001C.0180.0800.0000.136E :3126
U 136E. 081C.2030.0180.0A18.0000.136F :3127
U 136F. 0001.003C.8D80.0A98.0084.7338 :3128
U 1370. 0000.003C.0180.0800.0000.115A :3129

```

D_K[.1F],Q 0
D_DAL.SC,SC_K[.1F]
D_D.ORN0T.MASK
D_R[1].OR.D
R[4]_K[.3F]
R[3]_D,J/LOOPBITS
BACKWARD:
ALU RC[0D],CLK.UBCC
Z?,RC[0D]_K[.1]
=0 J/INCLSB
R[2] 0
R[3]_K[.8]
R[4]_K[.3F]
D_K[.1F]
SC_K[.9],Q 0
D_DAL.SC,SC_K[.1F]
D_D.ORN0T.MASK,SC_K[.F]
D_D.ORN0T.MASK,SC_K[.18]
SC_SC-K[.1]
R[3]_D.ORN0T.MASK,SC_K[.1F],J/LOOPBITS
INCLSB: D_RC[0C],SC_K[.6]
D_D.LEFT
R[0C]_D.AND.MASK,CLK.UBCC
Z?
=0 SC_K[.1F],J/NEXTLSB
J/ENDT006
INCADR: CALL[INCDECADDRESS]
SC_K[.1F],J/LOOPADDRESS
=0
BITSHIFT:
CALL[SETNEWDATABIT]
D_R[3]
D_D.ANDNOT.RC[0]
R[3]_D
ALU RC[0D],CLK.UBCC
Z?,SC_K[.9]
=0 J/BAKBITSHIFT
SC_K[.1F],J/LOOPBITS
BAKBITSHIFT:
D_K[.1F],Q 0
D_DAL.SC,SC_K[.1F]
D_D.ORN0T.MASK
D_R[3].OR.D
R[3]_D,SC_K[.1F],J/LOOPBITS
ENDT006:NOP

```

: ADDRESS AND INITIAL DATA PATTERN

: AM I DOING BACKWARD SEQ?

: BRANCH IF NO

: SELECT NEXT ADDRESS LSB

: SET THE DATA FLAG TO ZERO

: SET THE BIT LOOP COUNT

: SET THE CONCATENATED ADDRESS

: INIT ADDRESS AND DATA BITS

: FOR THE BACKWARD SEQUENCE

: ALSO INSERT BIT 23

: START BACKWARD SEQUENCE

: GET ENCREMENT VALUE

: SELECT NEXT VALUE

: DONE YET?

: NO

: DONE

: GET THE ADDRESS

: SAVE DATA BITS

: FOREWARD SEQUENCE?

: NO

: ADDRESS SET AT ZERO, CONTINUE

: SET THE MAX ADDRESS

: INSERT DATA BITS

: MAX ADDRESS, CONTINUE


```

    3130 .PAGE "TEST BB DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)"
    3131 *****
    3132 ++
    3133 TEST BB DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)
    3134
    3135 TEST DESCRIPTION
    3136
    3137 THIS TEST PERFORMS A MOVING INVERSIONS TEST OF THE TB DATA MEMORY.
    3138 MEMORY FAILURES ARE DETECTED BY A PARITY ERROR.
    3139
    3140 LOGIC DESCRIPTION
    3141
    3142 THIS TEST CHECKS THE MEMORY CHIPS OF THE TB DATA MEMORY ON THE
    3143 TBM MODULE AND THE CAM MODULE.
    3144
    3145 DATA DESCRIPTION
    3146
    3147 DATA: ADDRESS THAT HAD A PARITY ERROR
    3148 BACKWARD SEQUENCE FLAG (0 = FORWARD & 1 = BACKWARD SEQUENCE)
    3149 ADDRESS INCREMENT/DECREMENT VALUE
    3150 CONTENTS OF TBER1
    3151 ++
    3152 *****
    3153 =0
    3154 T007: NEWTST[.4]
    3155
    3156 INITIALIZE SOME FLAGS AND REGISTERS
    3157 :-
    3158 SC K[.9] ; GENERATE THE MASK FOR TAG
    3159 D_R[.1F],Q_0 ; BITS <31,13:9>
    3160 D-DAL.SC,SC_K[.1F]
    3161 R[0] D.ORN0T.MASK ; SAVE = 80003E00
    3162 RC[0C] K[.1] ; SET THE INCREMENT/DEC VALUE
    3163 SC K[.T4] ; GENERATE DATA FOR TBER0
    3164 D_NOT.MASK
    3165 D-D.OR.K[.1]
    3166 ID[TBER0] D ; TURN ON THE TB
    3167 =0 CALL[FILLZERO] ; FILL THE PTE'S WITH ZERO
    3168 SC K[.D]
    3169 D_R[.1F00],Q_0 ; GENERATE A MASK FOR THE
    3170 D-DAL.SC ; MUST BE ZERO MASK
    3171 R[5] D ; EQUALS 03E00000
    3172 D_K[.80]
    3173 D-D.LEFT ; GENERATE THE INITIAL DATA
    3174 D-D.OR.K[.1],Q_ALU ; PATTERN FOR THE PTE
    3175 D-D.SWAP
    3176 R[6] D.OR.Q,D_ALU ; EQUALS 01010101
    3177 R[8] D ; SAVE FOR BIT SHIFT
    3178 PTENEXTLSB:
    3179 RC[0D]_0 ; SET THE FORWARD SEQ FLAG
    3180 R[2]_0 ; SET THE DATA FLAG TO ZERO
    3181 R[3]_0 ; SET THE ADDRESS TO ZERO
    3182 R[4]_0 ; SET CONCATINATED TAG FILED TO ZERO
    3183 D_R[8] ; GET INITIAL DATA PATTERN
    3184 R[6]_D ; INIT THE PATTERN
    
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U 115A, 0018,0039,1180,09F8,0000,105B

U 115B, 0000,003C,D980,0800,0084,7371
 U 1371, 0818,0038,8DF8,0800,0000,1372
 U 1372, 0D00,003C,8D80,0800,0084,7373
 U 1373, 0001,001C,0180,0980,0000,1374
 U 1374, 0018,0038,0580,09E0,0000,1375
 U 1375, 0000,003C,2180,0800,0084,7376
 U 1376, 0803,001C,0180,0800,0000,1377
 U 1377, 0819,0030,0580,0800,0000,1378
 U 1378, 0000,003C,4980,3C00,0000,115C
 U 115C, 0000,003D,0180,0800,0000,1202
 U 115D, 0000,003C,8980,0800,0084,7379
 U 1379, 0818,0038,91F8,0800,0000,137A
 U 137A, 0D00,003C,0180,0800,0000,137B
 U 137B, 0001,003C,0180,0AA8,0000,137C
 U 137C, 0818,0038,4180,0800,0000,137D
 U 137D, 0500,003C,0180,0800,0000,137E
 U 137E, 0819,0030,05C0,0800,0000,137F
 U 137F, 0800,003C,0180,0800,0000,1380
 U 1380, 081D,0030,0180,0AB0,0000,1381
 U 1381, 0001,003C,0180,0AC0,0000,1382

U 1382, 0003,003C,0180,09E8,0000,1383
 U 1383, 0003,003C,0180,0A90,0000,1384
 U 1384, 0003,003C,0180,0A98,0000,1385
 U 1385, 0003,003C,0180,0AA0,0000,1386
 U 1386, 0800,003C,0180,0A40,0000,1387
 U 1387, 0001,003C,0180,0AB0,0000,1388

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U 1388, 0000,003C,01C0,0A28,0000,1389 :3185      Q R[5]                : GET MBZ MASK
U 1389, 001D,0024,0180,0AB8,0000,138A :3186      R[7]_D.ANDNOT.Q      : MASK MBZ BITS
:3187
:3188      ;+ NOW START THE FOREWARD SEQUENCE
:3189      READ THE LOCATION
:3190      WRITE THE COMPLIMENT BIT
:3191      READ THE LOCATION
:3192      ;-
U 138A, 0018,0038,0180,0998,0000,138B :3193      RC[3]_K[.8]        : SET THE LOOP COUNT FOR THE NUMBER
:3194                                     : OF BITS PER CHIP
:3195      PTELOOPBITS:
U 138B, 0018,0038,3180,0990,0000,138C :3196      RC[02]_K[.40]      : SET THE LOOP COUNT FOR THE NUMBER
:3197                                     : OF ADDRESSES PER CHIP
:3198      PTELOOPADDRESS:
U 138C, 0000,003C,5D80,0800,0084,738D :3199      SC_K[.7]           : SET THE PARITY ERROR MICRO
U 138D, 0003,001C,8D80,0AF8,0084,738E :3200      R[0F] NOT.MASK,SC_K[.1F] : TRAP FLAG
U 138E, 0800,003C,0180,0A18,0200,138F :3201      VA ALU,ALU_R[3],D_ALU    : READ THE LOCATION OF ZERO'S
U 138F, 0000,003C,0180,0000,0000,1390 :3202      MCT/TEST,RCHK          : PARITY ERROR?
U 1390, 0000,003C,0180,0A78,0010,1391 :3203      ALU R[0F],CLK,UBCC      : SHOULD BE NON ZERO
U 1391, 0000,013C,4DF0,2C00,0000,115E :3204      Z?,Q ID[BER1]          : BRANCH IF TRAP OCCURRED
U 115E, 0000,003C,0180,0800,0000,1392 :3205      =0 J/PTEADOK           :
U 115F, 0001,203C,5D80,09D8,0084,7160 :3206      SC_K[.7],RC[0B]_Q
U 1160, 0001,003D,0180,09F0,0000,118C :3207      =0 ERROR2,RC[0E]_D
U 1161, 0003,001C,8D80,0AF8,0084,7392 :3208      R[0F] NOT.MASK,SC_K[.1F] : PARITY ERROR ON READ
:3209
:3210      ;+ THE READ WAS OK, NOW WRITE THE COMPLIMENT BIT
:3211      ;-
:3212      PTEREADOK:
U 1392, 0000,003C,01C0,0A18,0200,1393 :3213      VA ALU,ALU_R[3],Q_ALU    : LOAD THE ADDRESS OF ONE'S
U 1393, 0800,003C,0180,0A38,0000,1394 :3214      D R[7]                 : GET PTE DATA
U 1394, 0000,003C,4180,3C00,0000,1395 :3215      ID[BUF]_D              : WRITE THE MEMORY
U 1395, 0C00,003C,0180,0000,0000,1396 :3216      MCT/TEST,RCHK,D_Q      : READ AND CHECK FOR PARITY ERROR
U 1396, 0000,003C,0180,0A78,0010,1397 :3217      ALU R[0F],CLK,UBCC      : SHOULD BE NON-ZERO
U 1397, 0000,013C,4DF0,2C00,0000,1162 :3218      Z?,Q ID[BER1]
U 1162, 0000,003C,0180,0800,0000,1398 :3219      =0 J/PTEADCOMPOK        : READ OF COMPLIMENT PATTERN OK
U 1163, 0001,203C,5D80,09D8,0084,7164 :3220      SC_K[.7],RC[0B]_Q
U 1164, 0001,003D,0180,09F0,0000,118C :3221      =0 ERROR2,RC[0E]_D
:3222                                     : PARITY ERROR OF READ ON COMPLIMENT
:3223                                     : PATTERN
U 1165, 0003,001C,8D80,0AF8,0084,7398 :3223      R[0F] NOT.MASK,SC_K[.1F]
:3224
:3225      ;+ NOW CHECK IF THE FOREWARD SEQUENCE IS DONE
:3226      ;-
:3227      PTEREADCOMPOK:
U 1398, 0810,0038,0180,0910,0000,1399 :3228      D RC[2]                 : GET THE ADDRESS LOOP COUNT
U 1399, 0019,0000,0580,0990,0010,139A :3229      RC[2]_D-K[.1],CLK,UBCC
U 139A, 0000,013C,0180,0800,0000,1166 :3230      Z?
U 1166, 0000,003C,0180,0800,0000,1172 :3231      =0 J/PTEINCDADR          : NOT DONE, GO INCRMENT THE TAG
U 1167, 0810,0038,0180,0918,0000,139B :3232      D RC[3]                 : DONE ALL THE BITS YET?
U 139B, 0019,0000,0580,0998,0010,139C :3233      RC[3]_D-K[.1],CLK,UBCC : BRANCH IF YES
U 139C, 0000,013C,0180,0800,0000,1168 :3234      Z?
U 1168, 0000,003C,0180,0800,0000,1174 :3235      =0 J/PTEBITSHIFT          : GO SELECT NEXT BIT
U 1169, 0000,003C,0180,0A10,0010,139D :3236      ALU R[2],CLK,UBCC        : DATA = 1?
U 139D, 0018,0138,0580,0A90,0000,116A :3237      Z?,R[2]_K[.1]           : BRANCH IF NO
U 116A, 0000,003C,0180,0800,0000,13AD :3238      =0 J/PTEBACKWARD          : SET BACKWARD SEQUENCE
U 116B, 0003,003C,0180,0A98,0084,739E :3239      RC[3]_0,SC_K[.8]        : SET THE ADDRESS TO ZERO
    
```

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U 139E, 0818,0038,4980,0800,0000,139F :3240      D_K[.FF]                ; SET THE DATA TO ALL ONES
U 139F, 0819,0000,0580,0A88,0000,13A0 :3241      D_D-K[.1],R[1],ALU    ; EXCEPT FOR BIT 0 OF EACH CHIP
U 13A0, 0D00,003C,0180,0800,0000,13A1 :3242      D_DAL.SC
U 13A1, 081C,2030,01C0,0A08,0000,13A2 :3243      D_D.OR.R[1],Q,ALU
U 13A2, 0B03,003C,0180,0AA0,0000,13A3 :3244      D_D.SWAP,R[4],0
U 13A3, 081D,0030,0180,0AB0,0000,13A4 :3245      D_D.OR.Q,R[6],ALU    ; EQUALS FEFEFEFE
U 13A4, 0000,003C,01C0,0A28,0000,13A5 :3246      Q_R[5]
U 13A5, 081D,0024,0180,0AB8,0000,13A6 :3247      D_D.ANDNOT.Q,R[7],ALU ; ZERO MBZ BITS
U 13A6, 0010,0038,0180,0968,0010,13A7 :3248      ALU RC[0D],CLK.UBCC   ; BACKWARD SEQ?
U 13A7, 0018,0138,0180,0998,0000,116C :3249      Z?,R[3],K[.8]      ; BRANCH IF NO
U 116C, 0000,003C,0180,0800,0000,13A8 :3250      =0 J/PTESETMAXADR
U 116D, 0000,003C,8D80,0800,0084,738B :3251      SC_K[.1F],J/PTELOOPBITS
                                     :3252      PTESETMAXADR:
                                     :3253      D_K[.1F]                ; SET THE MAX ADDRESS
U 13A8, 0818,0038,8D80,0800,0000,13A9 :3254      SC_K[.9],Q,0
U 13A9, 0000,003C,D9F8,0800,0084,73AA :3255      D_DAL.SC,SC_K[.1F]
U 13AA, 0D00,003C,8D80,0800,0084,73AB :3256      R[4],K[.3F]          ; SET THE CONCAT. ADDRESS
U 13AB, 0018,0038,5580,0AA0,0000,13AC :3257      R[3],D.ORNOT.MASK,J/PTELOOPBITS
U 13AC, 0001,001C,0180,0A98,0000,138B :3258      PTEBACKWARD:
U 13AD, 0010,0038,0180,0968,0010,13AE :3259      ALU RC[0D],CLK.UBCC   ; AM I DOING BACKWARD SEQ?
U 13AE, 0018,0138,0580,09E8,0000,116E :3260      Z?,R[0D],K[.1]     ; BRANCH IF NO
U 116E, 0000,003C,0180,0800,0000,13B8 :3261      =0 J/PTEINCLSB       ; SELECT NEXT ADDRESS LSB
U 116F, 0800,003C,0180,0A40,0000,13AF :3262      D_R[8]                ; GET INITIAL DATA PATTERN
U 13AF, 0000,003C,01C0,0A28,0000,13B0 :3263      Q_R[5]
U 13B0, 081D,0024,0180,0AB8,0000,13B1 :3264      D_D.ANDNOT.Q,R[7],ALU ; MASK MBZ BITS
U 13B1, 0003,003C,0180,0A90,0000,13B2 :3265      R[2],0                ; SET THE DATA FLAG TO ZERO
U 13B2, 0018,0038,0180,0998,0000,13B3 :3266      RC[3],K[.8]          ; SET THE BIT LOOP COUNT
U 13B3, 0018,0038,5580,0AA0,0000,13B4 :3267      R[4],R[.3F]          ; SET THE CONCATENATED ADDRESS
U 13B4, 0818,0038,8D80,0800,0000,13B5 :3268      D_K[.1F]             ; INIT ADDRESS AND DATA BITS
U 13B5, 0000,003C,D9F8,0800,0084,73B6 :3269      SC_K[.9],Q,0         ; FOR THE BACKWARD SEQUENCE
U 13B6, 0D00,003C,8D80,0800,0084,73B7 :3270      D_DAL.SC,SC_K[.1F]
U 13B7, 0801,001C,8D80,0A98,0084,73B8 :3271      R[3],ALU,D_D.ORNOT.MASK,SC_K[.1F],J/PTELOOPBITS
U 13B8, 0810,0038,D580,0960,0084,73B9 :3272      PTEINCLSB:D_RC[0C],SC_K[.6] ; GET ENCREMENT VALUE
U 13B9, 0500,003C,0180,0800,0000,13BA :3273      D_D.LEFT             ; SELECT NEXT VALUE
U 13BA, 0001,0034,0180,09E0,0010,13BB :3274      RC[0C],D.AND.MASK,CLK.UBCC ; DONE YET?
U 13BB, 0000,013C,0180,0800,0000,1170 :3275      Z?
U 1170, 0000,003C,8D80,0800,0084,73B2 :3276      =0 SC_K[.1F],J/PTENEXTLSB ; NO
U 1171, 0000,003C,0180,0800,0000,13C2 :3277      J/ENDT007           ; DONE
                                     :3278      =0
U 1172, 0000,003D,0180,0800,0000,1212 :3279      PTEINCADR:CALL[INCDECADDRESS]
U 1173, 0000,003C,8D80,0800,0084,738C :3280      SC_K[.1F],J/PTELOOPADDRESS
                                     :3281      =0
                                     :3282      PTEBITSHIFT:
U 1174, 0000,003D,0180,0800,0000,1232 :3283      CALL[PTESETNEWDATABIT]
U 1175, 0003,003C,0180,0A98,0000,13BC :3284      R[3],0                ; SET THE BASE ADDRESS FOR FOR SEQ
U 13BC, 0010,0038,0180,0968,0010,13BD :3285      ALU RC[0D],CLK.UBCC   ; FORWARD SEQ?
U 13BD, 0000,013C,D980,0800,0084,7176 :3286      Z?,SC_K[.9]
U 1176, 0000,003C,0180,0800,0000,13BE :3287      =0 J/PTEBAKBITSHIFT   ; NO
U 1177, 0000,003C,8D80,0800,0084,738B :3288      SC_K[.1F],J/PTELOOPBITS
                                     :3289      PTEBAKBITSHIFT:
U 13BE, 0818,0038,8DF8,0800,0000,13BF :3290      D_K[.1F],Q,0         ; SET THE MAXIMUM ADDRESS
U 13BF, 0D00,003C,8D80,0800,0084,73C0 :3291      D_DAL.SC,SC_K[.1F]
U 13C0, 0001,001C,8D80,0A98,0084,738B :3292      R[3],D.ORNOT.MASK,SC_K[.1F],J/PTELOOPBITS ; SET MAX ADDRESS
U 13C1, 0000,003C,8D80,0800,0084,738B :3293      SC_K[.1F],J/PTELOOPBITS
U 13C2, 0000,003C,0180,0800,0000,13C3 :3294      ENDT007:NOP
    
```

ZZ-ESKAH-V132 TEST BB DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)
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U 13C3, 0000,003D,0180,0800,0000,105B ;3295 ENDTST: NEWTST

ZZ
ES
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00000

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1867:	1838	1841=	1857=	1858=	1859=	1839	2264=
U 1008	1945=	1946=	1963=	1964=	1973=	1974=	1840	2265=
U 1010	1975=	1976=	1977=	1978=	1983=	1984=	1860	2799=
U 1018	1987=	1988=	1997=	1998=	1999=	2000=	1861	2800=
U 1020	2016=	2017=	2018=	2019=	2028=	2029=	1862	2910=
U 1028	2044=	2045=	2049=	2050=	2066=	2067=	1863	2911=
U 1030	2069=	2070=	2074=	2075=	2102=	2103=	1864	2963=
U 1038	2105=	2106=	2108=	2109=	2112=	2113=	1865	2964=
U 1040	2393=	2394=	2395=	2396=	2397=	2398=	2399=	2400=
U 1048	2115=	2116=	2118=	2119=	2122=	2123=	1896:	1866
U 1050	2462=	2463=	2464=	2465=	2466=	2467=	2468=	2469=
U 1058	2126=	2127=	1899:	1876	2164=	2165=	1902:	1877
U 1060	2542=	2543=	2544=	2545=	2546=	2547=	2548=	2549=
U 1068	2620=	2621=	2622=	2623=	2624=	2625=	2626=	2627=
U 1070	2698=	2699=	2700=	2701=	2702=	2703=	2704=	2705=
U 1078	2168=	2169=	2171=	2172=	2173=	2174=	2177=	2178=
U 1080	2180=	2181=	2182=	2183=	2186=	2187=	2189=	2190=
U 1088	2191=	2192=	2195=	2196=	2198=	2199=	2231=	2232=
U 1090	2235=	2236=	2252=	2253=	2256=	2257=	2289=	2290=
U 1098	2303=	2304=	2335=	2336=	2337=	2338=	2339=	2340=
U 10A0	2341=	2342=	2344=	2345=	2351=	2352=	2354=	2355=
U 10A8	2366=	2367=	2372=	2373=	2375=	2376=	2387=	2389=
U 10B0	2402=	2403=	2431=	2432=	2433=	2434=	2435=	2436=
U 10B8	2437=	2438=	2443=	2444=	2448=	2449=	2456=	2457=
U 10C0	2460=	2461=	2471=	2472=	2479=	2480=	2482=	2483=
U 10C8	2511=	2512=	2513=	2514=	2515=	2516=	2517=	2518=
U 10D0	2523=	2524=	2528=	2529=	2536=	2537=	2540=	2541=
U 10D8	2551=	2552=	2559=	2560=	2562=	2563=	2590=	2591=
U 10E0	2592=	2593=	2594=	2595=	2596=	2597=	2604=	2605=
U 10E8	2609=	2610=	2618=	2619=	2629=	2630=	2637=	2638=
U 10F0	2640=	2641=	2668=	2669=	2670=	2671=	2672=	2673=
U 10F8	2674=	2675=	2682=	2683=	2687=	2688=	2696=	2697=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1878	2708=	2709=	1834:	1835:	1836:	1837:
U 1110	2716=	2717=	2719=	2720=	2758=	2759=	2773=	2774=
U 1118	2783=	2784=	2793=	2794=	2796=	2797=	2806=	2807=
U 1120	2858=	2859=	2867=	2868=	2884=	2885=	2894=	2895=
U 1128	2904=	2905=	2907=	2908=	2916=	2917=	2925=	2926=
U 1130	2937=	2938=	2947=	2948=	2957=	2958=	2960=	2961=
U 1138	2969=	2970=	3002=	3006=	3015=	3016=	3039=	3040=
U 1140	3041=	3042=	3053=	3054=	3055=	3057=	3065=	3066=
U 1148	3069=	3070=	3072=	3073=	3080=	3081=	3093=	3094=
U 1150	3108=	3109=	3111=	3112=	1879	1922:	3115=	3116=
U 1158	3121=	3122=	3154=	3158=	3167=	3168=	3205=	3206=
U 1160	3207=	3208=	3219=	3220=	3221=	3223=	3231=	3232=
U 1168	3235=	3236=	3238=	3239=	3250=	3251=	3261=	3262=
U 1170	3276=	3277=	3279=	3280=	3283=	3284=	3287=	3288=
U 1178	1880	1881	1882	1883	2204:	2205:	2206:	2207:
U 1180	1884	1885	1886	1887	1888	1889	1890	1891
U 1188	1892	1893	1894	1895	1897	1898	1930	1931
U 1190	1937	1938	1939	1944	1947	1950	1951	1952
U 1198	1953	1956	1957	1958	1979	1980	1990	2001

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2002	2003	2009	2010	2011	2012	2013	2014
U 11A8	2015	2020	2021	2022	2023	2024	2025	2026
U 11B0	2027	2030	2031	2036	2037	2038	2039	2040
U 11B8	2041	2042	2043	2047	2048	2057	2058	2059
U 11C0	2060	2061	2062	2063	2064	2065	2068	2071
U 11C8	2072	2073	2077	2079	2080	2081	2082	2083
U 11D0	2084	2085	2086	2087	2088	2089	2090	2091
U 11D8	2092	2093	2094	2095	2096	2097	2098	2099
U 11E0	2100	2104	2110	2114	2120	2124	2128	2154
U 11E8	2155	2156	2157	2158	2159	2160	2161	2162
U 11F0	2163	2166	2167	2170	2175	2176	2179	2184
U 11F8	2185	2188	2193	2194	2208:	2209:	2210:	2211:
U 1200	2197	2203	2221	2222	2223	2224	2225	2226
U 1208	2227	2228	2229	2230	2233	2234	2238	2239
U 1210	2240	2241	2248	2249	2250	2251	2254	2255
U 1218	2259	2260	2262	2263	2267	2268	2269	2270
U 1220	2271	2272	2273	2274	2275	2282	2283	2284
U 1228	2285	2286	2287	2288	2291	2293	2294	2295
U 1230	2296	2297	2299	2300	2301	2302	2306	2307
U 1238	2309	2310	2311	2343	2346	2347	2348	2349
U 1240	2350	2353	2356	2357	2358	2359	2360	2361
U 1248	2362	2363	2364	2365	2368	2369	2370	2371
U 1250	2374	2377	2378	2379	2380	2381	2382	2383
U 1258	2384	2385	2386	2390	2391	2392	2401	2439
U 1260	2440	2441	2442	2445	2446	2447	2450	2451
U 1268	2452	2453	2454	2455	2458	2459	2470	2473
U 1270	2474	2475	2476	2477	2478	2481	2519	2520
U 1278	2521	2522	2525	2526	2527	2530	2531	2532
U 1280	2533	2534	2535	2538	2539	2550	2553	2554
U 1288	2555	2556	2557	2558	2561	2598	2599	2600
U 1290	2601	2602	2603	2606	2607	2608	2611	2612
U 1298	2613	2614	2615	2616	2617	2628	2631	2632
U 12A0	2633	2634	2635	2636	2639	2676	2677	2678
U 12A8	2679	2680	1923:	2681	2684	2685	2686	2689
U 12B0	2690	2691	2692	2693	2694	2695	2706	2707
U 12B8	2710	2711	2712	2713	2714	2715	2718	2760
U 12C0	2761	2762	2763	2764	2765	2766	2767	2768
U 12C8	2769	2770	2771	2772	2775	2776	2777	2778
U 12D0	2779	2781	2782	2785	2786	2787	2788	2789
U 12D8	2790	2791	2792	2795	2798	2802	2803	2804
U 12E0	2805	2809	2810	2811	2860	2861	2862	2869
U 12E8	2870	2871	2872	2873	2874	2875	2876	2877
U 12F0	2878	2879	2880	2881	2882	2883	2886	2887
U 12F8	2888	2889	2890	2891	2892	2893	2896	2897
U 1300	2899	2900	2901	2902	2903	2906	2909	2913
U 1308	2914	2915	2919	2927	2928	2929	2930	2931
U 1310	2932	2933	2934	2935	2936	2939	2940	2941
U 1318	2942	2943	2944	2945	2946	2949	2950	2952
U 1320	2953	2954	2955	2956	2959	2962	2966	2967
U 1328	2968	2972	2973	3007	3008	3009	3010	3011
U 1330	3012	3013	3014	3017	3018	3019	3020	3027
U 1338	3030	3033	3034	3035	3036	3037	3038	3047
U 1340	3048	3049	3050	3051	3052	3062	3063	3064

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3067	3068	3071	3074	3075	3076	3077	3078
U 1350	3079	3083	3084	3085	3086	3087	3088	3089
U 1358	3091	3092	3095	3096	3097	3098	3099	3100
U 1360	3101	3102	3103	3104	3105	3106	3107	3117
U 1368	3118	3119	3120	3124	3125	3126	3127	3128
U 1370	3129	3159	3160	3161	3162	3163	3164	3165
U 1378	3166	3169	3170	3171	3172	3173	3174	3175
U 1380	3176	3177	3179	3180	3181	3182	3183	3184
U 1388	3185	3186	3193	3196	3199	3200	3201	3202
U 1390	3203	3204	3213	3214	3215	3216	3217	3218
U 1398	3228	3229	3230	3233	3234	3237	3240	3241
U 13A0	3242	3243	3244	3245	3246	3247	3248	3249
U 13A8	3253	3254	3255	3256	3257	3259	3260	3263
U 13B0	3264	3265	3266	3267	3268	3269	3270	3271
U 13B8	3272	3273	3274	3275	3285	3286	3290	3291
U 13C0	3292	3293	3294	3295				
U 13C8 - 13EF	Unused							
U 13F0	1906:	1907:	1908:	1909:	1910:	1911:	1912:	1913:
U 13F8	1914:	1915:	1916:	1917:	1918:	1919:	1920:	1921:

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ESKODEF	0
ESKOMAC	0
ESKAHMAC	0
ESKAH2A	980

Used	980
Remaining	

Total microwords used in memory U: 980
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

[illegible]

ZZ-ESKAH-V132 Line Number Index J 8
ESKAH2A.MCR MICRO2 1M(01) 16-DEC-82 11:11:44

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; The files used in this assembly are:

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH2A.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1813	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 1953	TEST BC BRANCH ENABLE 11 -- LAST REFERENCE
: 2072	TEST BD TB ERROR REGISTER 0 BITS <15:10>

ZZ-ESKAH-V132 Subroutines
ESKAH2B.MCR

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SEQ 0510
Page

:1
:1804
:1805

.NOLIST
.LIST

ZZ

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:1806
:1807 :+
:1808 : FOLLOWING IS A SPECIAL MICRO CODE FIELD DEFINITION USED IN THE TEST
:1809 : FOR TB ERROR REGISTER BITS <15:10>
:1810 :
:1811 : SPECIAL/=<47:42>
:1812 :     PATTERN1=2B
:1813 :     PATTERN2=35
:1814 :     .TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1815 : REGION/1000,13FF
:1816 :+
:1817 : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1818 : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1819 : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1820 : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1821 : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1822 :
:1823 : FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1824 : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1825 : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1826 : R[OF] AND DO A RETURN.
:1827 :
:1828 : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1829 : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1830 : TO THE CONSOLE.
:1831 :
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:1849 :
:1850 :
:1851 :
:1852 :
:1853 :+
:1854 : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1855 : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1856 : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1857 :
:1858 : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1859 : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1860 : FAULT STATUS REGISTER

```

U 1100.	0000,003C,1980,0800,0084,7003	:1832	1100:	SC_K[ZERO],J/TRPH1	: SYSTEM INIT
U 1101.	0000,003C,0580,0800,0084,7001	:1833	1101:	SC_K[.1],J/TRPH0	: DATA UNALIGNED
U 1102.	0000,003C,0980,0800,0084,7001	:1834	1102:	SC_K[.2],J/TRPH0	: X PAGE ERROR
U 1103.	0000,003C,0D80,0800,0084,7001	:1835	1103:	SC_K[.3],J/TRPH0	: TB MODIFY
U 1104.	0000,003C,1180,0800,0084,7001	:1836	1104:	SC_K[.4],J/TRPH0	: TB PROT ERROR
U 1105.	0000,003C,D580,0800,0084,7001	:1837	1105:	SC_K[.6],J/TRPH0	: TB MISS
U 1106.	0000,003C,D980,0800,0084,7001	:1838	1106:	SC_K[.9],J/TRPH0	: RES FLOAT OPER
U 1107.	0000,003C,5D80,0800,0084,7001	:1839	1107:	SC_K[.7],J/TRPH0	: TB PARITY
U 1108.	0000,003C,0180,0800,0084,7001	:1840	1108:	SC_K[.8],J/TRPH0	: CACHE PARITY
U 110C.	0000,003C,8580,0800,0084,7003	:1841	110C:	SC_K[.C],J/TRPH1	: RDS
U 110D.	0000,003C,8980,0800,0084,7003	:1842	110D:	SC_K[.D],J/TRPH1	: TIME OUT
U 110E.	0000,003C,6580,0800,0084,7001	:1843	110E:	SC_K[.10],J/TRPH0	: ODD ADDRESS
U 110F.	0000,003C,6180,0800,0084,7003	:1844	110F:	SC_K[.F],J/TRPH1	: CS PARITY
U 1001.	0000,003C,81F0,2C00,0000,104F	:1845	TRPH0:	Q_ID[USTACK]	
U 104F.	0C00,003C,01E0,0800,0000,1056	:1846		Q_D,D,Q	
U 1056.	0000,003C,8180,3C00,0000,1057	:1847		ID[USTACK],D	
U 1057.	0C00,003C,01E0,0800,0000,1058	:1848		Q_D,D,Q	
U 1058.	0000,003C,01C0,0A78,0000,1059	:1849		Q-R[OF]	
U 1059.	0001,2024,0180,0800,0010,1058	:1850		ALU_Q.ANDNOT.MASK,CLK.UBCC	: WAS TRAP EXPECTED?
U 105B.	0000,013C,0180,0800,0000,1002	:1851		Z?	: BRANCH IF NO
U 1002.	0001,2036,0180,0AF8,0000,0000	:1852	=0	ALU_Q.AND.MASK,R[OF],ALU,RETURN	: CLEAR THE BIT AND RETURN


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:1861      :      SBI ERROR REGISTER
:1862      :      TIMEOUT ADDRESS REGISTER
:1863      :      MAINTENANCE REGISTER
:1864      :      CACHE PARITY REGISTER
:1865      :      TB ERROR REGISTER 1
:1866      :      TB ERROR REGISTER 0
:1867      :
U 1003. 0018.0038.1D80.09E8.0000.1004 :1868      TRPH1: RC[0D] SC
U 1004. 0000.003D.D980.0800.0084.707E :1869      =0      SETRCF[.9]
U 1005. 0000.003C.49F0.2C00.0000.105C :1870      Q_ID[TBER0]
U 105C. 0001.203C.4DF0.2DB0.0000.105D :1871      RC[6]_Q,Q_ID[TBER1]
U 105D. 0001.203C.65F0.2DB8.0000.105F :1872      RC[7]_Q,Q_ID[SBI.ERR]
U 105F. 0001.203C.6DF0.2DD8.0000.1060 :1873      RC[0B]_Q,Q_ID[FAULT]
U 1060. 0001.203C.75F0.2DE0.0000.1061 :1874      RC[0C]_Q,Q_ID[MAINT]
U 1061. 0001.203C.79F0.2DC8.0000.1062 :1875      RC[9]_Q,Q_ID[PARITY]
U 1062. 0001.203C.69F0.2DC0.0000.1063 :1876      RC[8]_Q,Q_ID[TIME.ADDR]
U 1063. 0001.203C.81F0.2DD0.0000.1000 :1877      RC[0A]_Q,Q_ID[USTACK]
U 1000. 0001.203D.0180.09F0.0000.1078 :1878      RC[0E]_Q,ERROR1
:1879      :
:1880      :      THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
:1881      :      MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
:1882      :      NEWTST
:1883      :      ERLOOP
:1884      :      ERROR1
:1885      :      ERROR2
:1886      :
U 1064. 0000.003C.65F8.0800.0084.7065 :1887      SCOPE: SC_K[.10],Q_0
U 1065. 0818.0038.8D80.0800.0000.1066 :1888      D_K[.1F]
U 1066. 0D00.003C.0180.0800.0000.1067 :1889      D-DAL.SC
U 1067. 0000.003C.3D80.3C00.0000.1068 :1890      ID[PSL]_D
U 1068. 0818.0038.0580.0800.0000.1069 :1891      D_K[.1]
U 1069. 0D00.003C.0180.0800.0000.106A :1892      D-DAL.SC
U 106A. 0F00.003C.3180.3C00.0000.106B :1893      ID[CES]_D,D_0
U 106B. 0000.003C.5D80.3C00.0000.106C :1894      ID[ACC.TS]_D
U 106C. 0000.003C.3980.3C00.0000.106D :1895      ID[SIR]_D
U 106D. 0000.003C.2980.3C00.0000.106E :1896      ID[CLK.TS]_D
U 106E. 0000.003C.4980.3C00.0000.106F :1897      ID[TBER0]_D
U 106F. 0818.0038.C180.0800.0000.1070 :1898      D_K[.FFFF]
U 1070. 0000.003C.6580.3C00.0000.1071 :1899      ID[SBI.ERR]_D
U 1071. 0F00.003C.6D80.3C00.0000.1072 :1900      ID[FAULT]_D,D_0
U 1072. 0000.003C.6D80.3C00.0000.1073 :1901      ID[FAULT]_D
U 1073. 0000.003C.6580.3C00.0000.1074 :1902      ID[SBI.ERR]_D
U 1074. 0003.003C.0180.09F0.0000.1075 :1903      RC[0E]_0
U 1075. 0003.003C.0180.0AF8.0000.1076 :1904      RC[0F]_0
U 1076. 0003.003C.0180.09E8.0000.105E :1905      RC[0D]_0,J/CALLCON
U 1077. 0818.0038.0980.0800.0000.105E :1906      ERLOOP: D_K[.2],J/CALLCON
U 1078. 0810.0038.0180.0978.0000.1079 :1907      ERROR1: D-RC[0F]
U 1079. 0819.0034.4D80.0800.0000.104E :1908      D-D.AND.K[.FF00]
U 104E. 0819.0030.1180.0800.0000.105E :1909      104E: D-D.OR.K[.4],J/CALLCON
U 107A. 0810.0038.0180.0978.C000.107B :1910      ERROR2: D-RC[0F]
U 107B. 0819.0034.4D80.0800.0000.105A :1911      D-D.AND.K[.FF00]
U 105A. 0819.0030.D580.0800.0000.105E :1912      105A: D-D.OR.K[.6],J/CALLCON
:1913      105E:
:1914      CALLCON:
:1915      ID[TXDB]_D,J/CALLCON
:      :      : CALL THE CONSOLE

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U 13F0, 0000,003C,0180,0800,0000,13F1
U 13F1, 0000,003C,0180,0800,0000,13F2
U 13F2, 0000,003C,0180,0800,0000,13F3
U 13F3, 0000,003C,0180,0800,0000,13F4
U 13F4, 0000,003C,0180,0800,0000,13F5
U 13F5, 0000,003C,0180,0800,0000,13F6
U 13F6, 0000,003C,0180,0800,0000,13F7
U 13F7, 0000,003C,0180,0800,0000,13F8
U 13F8, 0000,003C,0180,0800,0000,13F9
U 13F9, 0000,003C,0180,0800,0000,13FA
U 13FA, 0000,003C,0180,0800,0000,13FB
U 13FB, 0000,003C,0180,0800,0000,13FC
U 13FC, 0000,003C,0180,0800,0000,13FD
U 13FD, 0000,003C,0180,0800,0000,13FE
U 13FE, 0000,003C,0180,0800,0000,13FF
U 13FF, 0000,003C,0180,0800,0000,1155
U 1155, 0000,003C,0180,0800,0000,12AA
U 12AA, 0000,003C,0180,0800,0000,107C

U 107C, 0810,0038,4D80,0978,0000,107D
U 107D, 0019,4016,4D80,09F8,0000,0001

U 107E, 0010,0038,01C0,0978,0000,107F
U 107F, 0019,2034,4DC0,0800,0000,1080
U 1080, 0019,2032,1D80,09F8,0000,0001

;+
; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
;-
13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-
SUBTST: D RC[0F],KMX/.FF00
        RC[0F],D+K[.FF00],WORD,RETURN1

;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-
SETRCF: Q RC[0F]
        Q-Q.AND.K[.FF00]
        RC[0F],Q.OR.SC,RETURN1

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1953 .PAGE "TEST BC BRANCH ENABLE 11 -- LAST REFERENCE"
1954 *****
1955 ++
1956 TEST BC BRANCH ENABLE 11 -- LAST REFERENCE
1957
1958 TEST DESCRIPTION
1959
1960 THIS TEST CHECKS BRANCH ENABLE 11.
1961
1962 SUBTEST 1 - CHECK THAT CODE 0 ASSERTS WITH 'READ.V.WCHK'
1963
1964 SUBTEST 2 - CHECK THAT CODE 1 ASSERT WITH 'LOCKWRITE.V.XCHK'
1965
1966 SUBTEST 3 - CHECK THAT CODE 0 AND 1 ASSERT WITH 'WRITE.V.WCHK'
1967
1968 SUBTEST 4 - CHECK THAT CODE 0 DOES NOT ASSERT WITH UMCT2 & 3 TRUE
1969
1970 SUBTEST 5 - CHECK THAT CODE 0 DOES NOT ASSERT WITH 'WRITE CHECK' FALSE
1971
1972 LOGIC DESCRIPTION
1973
1974 THIS TEST CHECKS THE LOGIC ON THE TBM AND USC MODULE THAT GENERATE
1975 THE SIGNALS 'LAST REF CODE 0 & 1'.
1976
1977 ERROR DESCRIPTION
1978
1979 DATA: EXPECTED BRANCH BITS 0 AND 1
1980 RECEIVED BRANCH BITS 0 AND 1
1981
1982 SYNC POINT DESCRIPTION
1983
1984 SUBTEST 1 - SYNC00--LAST REF CODE IS LATCHED
1985 SUBTEST 2 - SYNC01--LAST REF CODE IS LATCHED
1986 SUBTEST 3 - SYNC02--LAST REF CODE IS LATCHED
1987 SUBTEST 4 - SYNC03--LAST REF CODE IS LATCHED
1988 SUBTEST 5 - SYNC04--LAST REF CODE IS LATCHED
1989
1990 --
1991 *****
1992 =0
1993 T001: NEWTST[.2]
1994 VA ALU,ALU_0(A)
1995 D RC[.19]
1996 SC K[C],Q_0
1997 D BAL.SC
1998 ID[MAINT]_D,D_0
1999 ID[TBERO]_D ; SHUT OFF THE TB
2000 ://///////////////7/////////////////
2001 +
2002 CHECK 'LAST REF CODE 0' TRUE WITH A READ.V.WCHK FUNCTION
2003
2004 =0 SUBTEST
2005 RC[OE]_K[.2] ; SET THE EXPECTED DATA
2006 =0 ERLOOP
2007 SYNC00: MCT/READ.V.WCHK ; EXECUTE THE FUNCTION

U 1006, 0018,0039,0980,09F8,0000,1064
U 1007, 0003,003C,0180,0800,0200,1081
U 1081, 0818,0038,8980,0800,0000,1082
U 1082, 0000,003C,85F8,0800,0084,7083
U 1083, 0D00,003C,0180,0800,0000,1084
U 1084, 0F00,003C,7580,3C00,0000,1085
U 1085, 0000,003C,4980,3C00,0000,1008

U 1008, 0000,003D,0180,0800,0000,107C
U 1009, 0018,0038,0980,09F0,0000,100A
U 100A, 0000,003D,0180,0800,0000,1077
U 100B, 0000,003C,0180,5000,0000,1010
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U 1010, 0818,1139,0980,0800,0000,100C :2008 =0 LAST.REF?,CALL,J/BEN11,D_K[.2] ; CHECK THE BRANCH BITS
U 1011, 001D,2000,0180,0800,0010,1086 :2009 ALU_Q-D,CLK.UBCC ; CHECK FOR CODE 0
U 1086, 0000,013C,0180,0800,0000,1012 :2010 Z?
U 1012, 0001,203D,0180,09E8,0000,107A :2011 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
U 1013, 0000,003C,0180,0800,0000,1014 :2012 NOP
:2013 :////////////////////
:2014 :+
:2015 : CHECK 'LAST REF CODE 1' TRUE WITH A LOCKWRITE.V.XCHK FUNCTION
:2016 :-
U 1014, 0000,003D,0180,0800,0000,107C :2017 =0 SUBTEST
U 1015, 0018,0038,0580,09F0,0000,1087 :2018 RC[OE]_K[.1]
U 1087, 0018,0038,4180,0800,0200,1016 :2019 VA_ALU,ALU_K[.80] ; SET THE VA
U 1016, 0000,003D,0180,0800,0000,1077 :2020 =0 ERLOOP
U 1017, 0000,003C,0180,3800,0000,1018 :2021 SYNC01: MCT/LOCKWRITE.V.XCHK ; EXECUTE THE FUNCTION
U 1018, 0818,1139,0580,0800,0000,100C :2022 =0 LAST.REF?,CALL,J/BEN11,D_K[.1] ; EXECUTE THE BRANCH
U 1019, 001D,2000,0180,0800,0010,1088 :2023 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
U 1088, 0000,013C,0180,0800,0000,101A :2024 Z?
U 101A, 0001,203D,0180,09E8,0000,107A :2025 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
U 101B, 0000,003C,0180,0800,0000,101C :2026 NOP
:2027 :////////////////////
:2028 :+
:2029 : CHECK 'LAST REF CODE 0 & 1' TRUE WITH WRITE.V.WCHK FUNCTION
:2030 :-
U 101C, 0000,003D,0180,0800,0000,107C :2031 =0 SUBTEST
U 101D, 0018,0038,0D80,09F0,0000,101E :2032 RC[OE]_K[.3]
U 101E, 0000,003D,0180,0800,0000,1077 :2033 =0 ERLOOP
U 101F, 0000,003C,0180,3000,0000,1020 :2034 SYNC02: MCT/WRITE.V.WCHK ; EXECUTE THE FUNCTION
U 1020, 0818,1139,0D80,0800,0000,100C :2035 =0 LAST.REF?,CALL,J/BEN11,D_K[.3] ; EXECUTE THE BRANCH
U 1021, 001D,2000,0180,0800,0010,1089 :2036 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
U 1089, 0000,013C,0180,0800,0000,1022 :2037 Z?
U 1022, 0001,203D,0180,09E8,0000,107A :2038 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
U 1023, 0000,003C,0180,0800,0000,1024 :2039 NOP
:2040 :////////////////////
:2041 :+
:2042 : CHECK 'LAST REF CODE 0' FALSE WITH UMCT 2 AND 3 ENABLED
:2043 :-
U 1024, 0000,003D,0180,0800,0000,107C :2044 =0 SUBTEST
U 1025, 0018,0038,0580,09F0,0000,1026 :2045 RC[OE]_K[.1]
U 1026, 0000,003D,0180,0800,0000,1077 :2046 =0 ERLOOP
U 1027, 0000,003C,0180,7000,0000,1028 :2047 SYNC03: MCT/LOCKREAD.V.WCHK ; EXECUTE THE FUNCTION
U 1028, 0818,1139,0580,0800,0000,100C :2048 =0 LAST.REF?,CALL,J/BEN11,D_K[.1] ; EXECUTE THE BRANCH
U 1029, 001D,2000,0180,0800,0010,108A :2049 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
U 108A, 0000,013C,0180,0800,0000,102A :2050 Z?
U 102A, 0001,203D,0180,09E8,0000,107A :2051 =0 ERROR2,RC[OD]_Q ; BRANCH FAILED
U 102B, 0000,003C,0180,0800,0000,102C :2052 NOP
:2053 :////////////////////
:2054 :+
:2055 : CHECK THAT CODE 0 DOES NOT ASSERT WITH 'WRITE CHECK' FALSE
:2056 :-
U 102C, 0000,003D,0180,0800,0000,107C :2057 =0 SUBTEST
U 102D, 0003,003C,0180,09F0,0000,102E :2058 RC[OE]_Q
U 102E, 0000,003D,0180,0800,0000,1077 :2059 =0 ERLOOP
U 102F, 0000,003C,0180,4000,0000,1030 :2060 SYNC04: MCT/READ.V.RCHK ; EXECUTE THE FUNCTION
U 1030, 0F00,113D,0180,0800,0000,100C :2061 =0 LAST.REF?,CALL,J/BEN11,D_Q ; EXECUTE THE BRANCH
U 1031, 001D,2000,0180,0800,0010,108B :2062 ALU_Q-D,CLK.UBCC ; CHECK THE RESULT
    
```


E 9

ZZ
ES

: BRANCH FAILED

[illegible]

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2072 .PAGE "TEST BD TB ERROR REGISTER 0 BITS <15:10>"
2073 *****
2074 ++
2075
2076 TEST BD TB ERROR REGISTER 0 BITS <15:10>
2077
2078 TEST DESCRIPTION
2079
2080 THIS TEST CHECKS THAT BITS <15:10> OF TB ERROR REGISTER 0 CAN BE
2081 SET AND CLEARED CORRECTLY.
2082
2083 SUBTEST 1 - CHECK BITS <15:10>=001010 LOADED BY 'EN TB PAR'
2084
2085 SUBTEST 2 - CHECK BITS <15:10>=010101 LOADED BY 'UADS'
2086
2087 SUBTEST 3 - CHECK BITS <15:10>=001100 LOADED BY 'UNEWPC'
2088
2089 SUBTEST 4 - CHECK BITS <15:10>=110101 LOADED BY 'UADS'
2090
2091 SUBTEST 5 - CHECK BITS <15:10>=111010 LOADED BY 'UADS'
2092
2093 LOGIC DESCRIPTION
2094
2095 THIS TEST CHECKS BITS <15:10> OF THE TB ERROR REGISTER 0 ON THE
2096 TBM MODULE.
2097
2098 ERROR DESCRIPTION
2099
2100 DATA: EXPECTED VALUE OF BITS <15:10>
2101 RECEIVED VALUE OF BITS <15:10>
2102 --
2103 *****
2104 =0
2105 T005: NEWTST[.2]
2106 D_0 ; SHUT OFF THE TB
2107 ID[TBER0]_D
2108 D_K[.FFFC] ; GENERATE MASK FOR BITS <15:10>
2109 D-D.AND.K[.FF]
2110 SC_K[.8],Q_0
2111 D-DAL.SC
2112 R[0]_D ; SAVE
2113 ://///////////////
2114 +
2115 : FIRST CHECK BITS <15:10>=001010 (READ.V.WCHK)
2116 :-
2117 =0 SUBTEST
2118 D_K[.A],SC_K[.A],Q_0 ; GENERATE EXPECTED DATA
2119 D-DAL.SC
2120 R[OE]_D ; EQUALS 2800
2121 =0 ERLOOP
2122 MCT/READ.V.WCHK ; EXECUTE THE FUNCTION
2123 Q_ID[TBER0]_D_R[OE] ; READ THE ERROR REGISTER
2124 Q-Q.AND.R[0] ; MASK
2125 A[U-Q-D.CLK.UBCC ; CHECK
2126 Z?
    
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U 1034, 0018,0039,0980,09F8,0000,1064
 U 1035, 0F00,003C,0180,0800,0000,108D
 U 108D, 0000,003C,4980,3C00,0000,108E
 U 108E, 0818,0038,F180,0800,0000,108F
 U 108F, 0819,0034,4980,0800,0000,1090
 U 1090, 0000,003C,01F8,0800,0084,7091
 U 1091, 0D00,003C,0180,0800,0000,1092
 U 1092, 0001,003C,0180,0A80,0000,1036

U 1036, 0000,003D,0180,0800,0000,107C
 U 1037, 0818,0038,F5F8,0800,0084,7093
 U 1093, 0D00,003C,0180,0800,0000,1094
 U 1094, 0001,003C,0180,09F0,0000,1038
 U 1038, 0000,003D,0180,0800,0000,1077
 U 1039, 0000,003C,0180,5000,0000,1095
 U 1095, 0810,0038,49F0,2D70,0000,1096
 U 1096, 001C,0034,01C0,0A00,0000,1097
 U 1097, 001D,2000,0180,0800,0010,1098
 U 1098, 0000,013C,0180,0800,0000,103A

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U 103A, 0001,203D,0180,09E8,0000,107A :2127 =0 ERROR2,RC[OD]_Q ; ERROR REGISTER INCORRECT
U 103B, 0000,003C,0180,0800,0000,103C :2128 NOP
:2129 ;////////////////////
:2130 ;+
:2131 ; CHECK ERROR REGISTER BITS <15:10>=010101 (WRITE.P)
:2132 ;-
U 103C, 0000,003D,0180,0800,0000,107C :2133 =0 SUBTEST
U 103D, 0818,0038,2180,0800,0000,1099 :2134 D_K[.14]
U 1099, 0819,0014,0580,0800,0000,109A :2135 D-D+K[.1]
U 109A, 0000,003C,F5F8,0800,0084,709B :2136 SC_K[.A],Q_0
U 109B, 0D00,003C,0180,0800,0000,109C :2137 D_DAL.SC
U 109C, 0001,003C,0180,09F0,0000,103E :2138 RC[OE]_D ; SAVE EXPECTED DTAA = 5400
U 103E, 0000,003D,0180,0800,0000,1077 :2139 =0 ERLOOP
U 103F, 0000,003C,0180,A800,0000,109D :2140 MCT/WRITE.P ; EXECUTE THE FUNCTION
U 109D, 0810,0038,49F0,2D70,0000,109E :2141 Q_ID[TBER0],D_RC[OE] ; READ THE ERROR REGISTER
U 109E, 001C,0034,01C0,0A00,0000,109F :2142 Q_Q.AND.R[0] ; MASK
U 109F, 001D,2000,0180,0800,0010,10A0 :2143 A[U_Q-D,CLK.UBCC ; CEHCK
U 10A0, 0000,013C,0180,0800,0000,1040 :2144 Z?
U 1040, 0001,203D,0180,09E8,0000,107A :2145 =0 ERROR2,RC[OD]_Q ; ERROR REGISTER INCORRECT
U 1041, 0000,003C,0180,0800,0000,1042 :2146 NOP
:2147 ;////////////////////
:2148 ;+
:2149 ; CHECK ERROR REGISTER BITS <15:10>=001100 (READ.V.NEWPC)
:2150 ;-
U 1042, 0000,003D,0180,0800,0000,107C :2151 =0 SUBTEST
U 1043, 0818,0038,8580,0800,0000,10A1 :2152 D_K[.C]
U 10A1, 0000,003C,F5F8,0800,0084,70A2 :2153 SC_K[.A],Q_0
U 10A2, 0D00,003C,0180,0800,0000,10A3 :2154 D_DAL.SC
U 10A3, 0001,003C,0180,09F0,0000,1044 :2155 RC[OE]_D ; SAVE EXPECTED DATA = 3000
U 1044, 0000,003D,0180,0800,0000,1077 :2156 =0 ERLOOP
U 1045, 0000,003C,0180,6000,0000,10A4 :2157 MCT/READ.V.NEWPC ; EXECUTE THE FUNCTION
U 10A4, 0810,0038,49F0,2D70,0000,10A5 :2158 Q_ID[TBER0],D_RC[OE] ; READ THE REGISTER
U 10A5, 001C,0034,01C0,0A00,0000,10A6 :2159 Q_Q.AND.R[0] ; MASK
U 10A6, 001D,2000,0180,0800,0010,10A7 :2160 A[U_Q-D,CLK.UBCC ; CEHCK
U 10A7, 0000,013C,0180,0800,0000,1046 :2161 Z?
U 1046, 0001,203D,0180,09E8,0000,107A :2162 =0 ERROR2,RC[OD]_Q ; ERROR REGISTER INCORRECT
U 1047, 0000,003C,0180,0800,0000,1048 :2163 NOP
:2164 ;////////////////////
:2165 ;+
:2166 ; CHECK ERROR REGISTER BITS <15:10>=110101 (SPECIAL/PATTERN1)
:2167 ;-
U 1048, 0000,003D,0180,0800,0000,107C :2168 =0 SUBTEST
U 1049, 0818,0038,2980,0800,0000,10A8 :2169 D_K[.34]
U 10A8, 0819,0014,0580,0800,0000,10A9 :2170 D-D+K[.1]
U 10A9, 0000,003C,F5F8,0800,0084,70AA :2171 SC_K[.A],Q_0
U 10AA, 0D00,003C,0180,0800,0000,10AB :2172 D_DAL.SC
U 10AB, 0001,003C,0180,09F0,0000,104A :2173 RC[OE]_D ; SAVE EXPECTED DATA = D400
U 104A, 0000,003D,0180,0800,0000,1077 :2174 =0 ERLOOP
U 104B, 0000,003C,0180,AC00,0000,10AC :2175 SPECIAL/PATTERN1 ; EXECUTE THE FUNCTION
U 10AC, 0810,0038,49F0,2D70,0000,10AD :2176 Q_ID[TBER0],D_RC[OE] ; READ THE REGISTER
U 10AD, 001C,0034,01C0,0A00,0000,10AE :2177 Q_Q.AND.R[0] ; MASK
U 10AE, 001D,2000,0180,0800,0010,10AF :2178 A[U_Q-D,CLK.UBCC ; CHECK
U 10AF, 0000,013C,0180,0800,0000,104C :2179 Z?
U 104C, 0001,203D,0180,09E8,0000,107A :2180 =0 ERROR2,RC[OD]_Q ; REGISTER INCORRECT
U 104D, 0000,003C,0180,0800,0000,1050 :2181 NOP

```

```

:2182 :////////////////////////
:2183 :+
:2184 : CHECK ERROR REGISTER BITS <15:10>=111010 (SPECIAL/PATTERN2)
:2185 :-
U 1050, 0000,003D,0180,0800,0000,107C :2186 =0 SUBTEST
U 1051, 0818,0038,7980,0800,0000,1080 :2187 D_K[,30]
U 1080, 0000,003C,F5F8,0800,0084,70B1 :2188 ST_K[,A],Q_0
U 10B1, 0819,0014,F580,0800,0000,10B2 :2189 D_B+K[,A]
U 10B2, 0D00,003C,0180,0800,0000,10B3 :2190 D_DAL,SC
U 10B3, 0001,003C,0180,09F0,0000,1052 :2191 RC[OE],D ; SAVE EXPECTED DATA = E800
U 1052, 0000,003D,0180,0800,0000,1077 :2192 =0 ERLOOP
U 1053, 0000,003C,0180,D400,0000,10B4 :2193 SPECIAL/PATTERN2 ; EXECUTE THE FUNCTION
U 10B4, 0810,0038,49F0,2D70,0000,10B5 :2194 Q_ID[TBER0],D_RC[OE] ; READ THE REGISTER
U 10B5, 001C,0034,01C0,0A00,0000,10B6 :2195 Q_Q.AND.R[0] ; MASK
U 10B6, 001D,2000,0180,0800,0010,10B7 :2196 A[U_Q-D,CLK.UBCC ; CHECK
U 10B7, 0000,013C,0180,0800,0000,1054 :2197 Z?
U 1054, 0001,203D,0180,09E8,0000,107A :2198 =0 ERROR2,RC[OD],Q ; REGISTER INCORRECT
U 1055, 0000,003C,0180,0800,0000,10B8 :2199 NOP
U 10B8, 0000,003D,0180,0800,0000,1064 :2200 DUM: NEWTST
```


:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- 0FFF Unused							
U 1000	1878:	1845	1852=	1868=	1869=	1870=	1993=	1994=
U 1008	2004=	2005=	2006=	2007=	2067=	2068=	2069=	2070=
U 1010	2008=	2009=	2011=	2012=	2017=	2018=	2020=	2021=
U 1018	2022=	2023=	2025=	2026=	2031=	2032=	2033=	2034=
U 1020	2035=	2036=	2038=	2039=	2044=	2045=	2046=	2047=
U 1028	2048=	2049=	2051=	2052=	2057=	2058=	2059=	2060=
U 1030	2061=	2062=	2064=	2065=	2105=	2106=	2117=	2118=
U 1038	2121=	2122=	2127=	2128=	2133=	2134=	2139=	2140=
U 1040	2145=	2146=	2151=	2152=	2156=	2157=	2162=	2163=
U 1048	2168=	2169=	2174=	2175=	2180=	2181=	1909:	1846
U 1050	2186=	2187=	2192=	2193=	2198=	2199=	1847	1848
U 1058	1849	1850	1912:	1851	1871	1872	1915:	1873
U 1060	1874	1875	1876	1877	1887	1888	1889	1890
U 1068	1891	1892	1893	1894	1895	1896	1897	1898
U 1070	1899	1900	1901	1902	1903	1904	1905	1906
U 1078	1907	1908	1910	1911	1943	1944	1950	1951
U 1080	1952	1995	1996	1997	1998	1999	2010	2019
U 1088	2024	2037	2050	2063	2071	2107	2108	2109
U 1090	2110	2111	2112	2119	2120	2123	2124	2125
U 1098	2126	2135	2136	2137	2138	2141	2142	2143
U 10A0	2144	2153	2154	2155	2158	2159	2160	2161
U 10A8	2170	2171	2172	2173	2176	2177	2178	2179
U 10B0	2188	2189	2190	2191	2194	2195	2196	2197
U 10B8	2200							
U 10C0	- 10FF Unused							
U 1100	1832:	1833:	1834:	1835:	1836:	1837:	1838:	1839:
U 1108	1840:				1841:	1842:	1843:	1844:
U 1110	- 114F Unused							
U 1150						1935:		
U 1158	- 12A7 Unused							
U 12A8			1936:					
U 12B0	- 13EF Unused							
U 13F0	1919:	1920:	1921:	1922:	1923:	1924:	1925:	1926:
U 13F8	1927:	1928:	1929:	1930:	1931:	1932:	1933:	1934:

22

ESKODEF	0
ESKOMAC	0
ESKAMAC	0
ESKAH2B	216

Used	216
Remaining	

```
Total microwords used in memory U: 216
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

222

[illegible]

2222

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—————

ZZ-ESKAH-V132 Line Number Index

ESKAH2B.MCR

MICRO2 1M(01)

16-DEC-82 11:14:23

K 9

SEQ 0522

Page 6

; The files used in this assembly are:

ESK00DEF.MIC

ESK00MAC.MIC

ESKAHMAC.MIC

ESKAH2B.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

ZZ
ES

U

U
U

22-ESKAH-V132
ESKAH2C.MCR

Subroutines

1M(01)

16-DEC-82

11:16:42

19

SEO 0524

Page

1
1804
1805

.NOLIST

INDEX LIST

22

0000000000000000000000000000000000

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:1806
:1807
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TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF]. R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED. THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN R[OF] AND DO A RETURN.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL TO THE CONSOLE.

```

1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
1101: SC_K[.1],J/TRPH0       : DATA UNALIGNED
1102: SC_K[.2],J/TRPH0       : X PAGE ERROR
1103: SC_K[.3],J/TRPH0       : TB MODIFY
1104: SC_K[.4],J/TRPH0       : TB PROT ERROR
1105: SC_K[.6],J/TRPH0       : TB MISS
1106: SC_K[.9],J/TRPH0       : RES FLOAT OPER
1107: SC_K[.7],J/TRPH0       : TB PARITY
1108: SC_K[.8],J/TRPH0       : CACHE PARITY
110C: SC_K[.C],J/TRPH1       : RDS
110D: SC_K[.D],J/TRPH1       : TIME OUT
110E: SC_K[.10],J/TRPH0      : ODD ADDRESS
110F: SC_K[.F],J/TRPH1       : CS PARITY
TRPH0: Q_ID[USTACK]
      Q_D,D,Q
      ID[USTACK],D
      Q_D,D,Q
      Q-R[OF]
      ALU_Q.ANDNOT.MASK,CLK.UBCC : WAS TRAP EXPECTED?
      Z?                          : BRANCH IF NO
      =0
      ALU_Q.AND.MASK,R[OF],ALU,RETURNO : CLEAR THE BIT AND RETURN

```

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED. IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER
      CACHE PARITY REGISTER
      TB ERROR REGISTER 1
      TB ERROR REGISTER 0

```

U 1003, 0018,0038,1D80,09E8,0000,101E :1861
U 101E, 0000,003D,D980,0800,0084,7249 :1862
U 101F, 0000,003C,49F0,2C00,0000,1057 :1863
U 1057, 0001,203C,4DF0,2DB0,0000,105B :1864
U 105B, 0001,203C,65F0,2DB8,0000,105F :1865
U 105F, 0001,203C,6DF0,2DD8,0000,1109 :1866
U 1109, 0001,203C,75F0,2DE0,0000,1154 :1867
U 1154, 0001,203C,79F0,2DC8,0000,122D :1868
U 122D, 0001,203C,69F0,2DC0,0000,122E :1869
U 122E, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1243 :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q ID[TBER0]
RC[6] Q,Q ID[TBER1]
RC[7] Q,Q ID[SBI.ERR]
RC[0B] Q,Q ID[FAULT]
RC[0C] Q,Q ID[MAINT]
RC[9] Q,Q ID[PARITY]
RC[8] Q,Q ID[TIME.ADDR]
RC[0A] Q,Q ID[USTACK]
1000: RC[0E] Q,ERROR1

:+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

:1872
:1873
:1874
:1875
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:1911
:1912
:1913
:1914
:1915

SCOPE: SC K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D RC[.1F] : ...
D DAL.SC
ID[PSL] D : WRITE THE PSL
D K[.1] : SETUP TO CLEAR THE CES REGISTER
D DAL.SC
ID[CES] D,D_0 : CLEAR THE CES REGISTER
ID[ACC.CS] D : SHUT OFF THE FLOATING POINT
ID[SIR] D : CLEAR THE SIR REGISTER
ID[CLK.CS] D : STOP INTERVAL TIMER
ID[TBER0] D : SHUT OFF THE TB
D K[.FFFF]
ID[SBI.ERR] D
ID[FAULT] D,D_0
ID[FAULT] D
ID[SBI.ERR] D

RC[0E] 0
RC[0F] 0
RC[0D] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D RC[0F]
D D.AND.K[.FF00]
104E: D D.OR.K[.4],J/CALLCON
ERROR2: D RC[0F]
D D.AND.K[.FF00]
105A: D D.OR.K[.6],J/CALLCON
105E:
CALLCON:

ID[TXDB] D,J/CALLCON : CALL THE CONSOLE
:+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 105E, 0000,003C,1D80,3C00,0000,105E :1908
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```
U 13F4. 0000,003C,0180,0800,0000,13F5 :1916 13F4: NOP
U 13F5. 0000,003C,0180,0800,0000,13F6 :1917 13F5: NOP
U 13F6. 0000,003C,0180,0800,0000,13F7 :1918 13F6: NOP
U 13F7. 0000,003C,0180,0800,0000,13F8 :1919 13F7: NOP
U 13F8. 0000,003C,0180,0800,0000,13F9 :1920 13F8: NOP
U 13F9. 0000,003C,0180,0800,0000,13FA :1921 13F9: NOP
U 13FA. 0000,003C,0180,0800,0000,13FB :1922 13FA: NOP
U 13FB. 0000,003C,0180,0800,0000,13FC :1923 13FB: NOP
U 13FC. 0000,003C,0180,0800,0000,13FD :1924 13FC: NOP
U 13FD. 0000,003C,0180,0800,0000,13FE :1925 13FD: NOP
U 13FE. 0000,003C,0180,0800,0000,13FF :1926 13FE: NOP
U 13FF. 0000,003C,0180,0800,0000,1155 :1927 13FF: NOP
U 1155. 0000,003C,0180,0800,0000,12AA :1928 1155: NOP
U 12AA. 0000,003C,0180,0800,0000,1247 :1929 12AA: NOP
:1930
:1931 ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1932 ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1933 ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1934 ; TYPING IT.
:1935
:1936 SUBTST: D RC[0F],KMX/.FF00
U 1247. 0810,0038,4D80,0978,0000,1248 :1936
U 1248. 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939 ;+
:1940 ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:1941 ; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:1942 ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:1943
:1944 SETRCF: Q RC[0F]
:1945 Q-Q.AND.K[.FF00]
:1946 RC[0F] Q.OR.SC,RETURN1
:1947
:1948 ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
:1949 ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
:1950 ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
:1951 ; ARE LOST.
:1952 CSOFF: D 0,Q,C,ALU,K[.FFFF]
:1953 =0 D-D.LEFT,S177,CALL,J/DC9
:1954 SC K[C]
:1955 D DAL.SC
:1956 ID[MAINT] D,RETURN1
:1957 ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
:1958 ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
:1959 COFF: D K[.3],Q-0
:1960 SC K[F]
:1961 D DAL.SC
:1962 ID[MAINT] D,RETURN1
:1963 ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
:1964 ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
:1965 SOFF: SC K[C]
:1966 ALD NOT,MASK,D,ALU
:1967 ID[MAINT] D,RETURN1
:1968 ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
:1969 ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
:1970 ; CERTAIN TRAPS.
:1970 =0
DC.DE: CALL,J/DCD
U 1046. 0000,003D,0180,0800,0000,1297 :1970
```



```
U 1047, 0000,003C,0180,0800,0000,104C :1971
U 104C, 0000,003D,0180,0800,0000,1298 :1972
U 104D, 0000,003E,0180,0800,0000,0001 :1973
:1974
:1975
:1976
:1977
:1978
:1979
:1980
:1981
U 1058, 0F00,003D,0180,0800,0000,1292 :1982
U 1059, 0100,003C,0180,0800,0000,105C :1983
U 105C, 0100,003D,0180,0800,0000,128A :1984
U 105D, 0100,003C,0180,0800,0000,1070 :1985
U 1070, 0100,003D,0180,0800,0000,128B :1986
U 1071, 0800,003C,4980,3E40,0000,1256 :1987
U 1256, 0000,003C,4180,3C00,0000,1257 :1988
U 1257, 0000,003E,4DF0,2C00,0000,0001 :1989
:1990
:1991
U 1072, 0F00,003D,0180,0800,0000,128E :1992
U 1073, 0000,003C,0180,0800,0000,1059 :1993
:1994
:1995
U 1074, 0F00,003D,0180,0800,0000,1292 :1996
U 1075, 0500,003C,0180,0800,0000,1059 :1997
:1998
U 1258, 0818,0038,0580,0800,0000,1071 :1999
:2000
:2001
:2002
:2003
:2004
:2005
U 1076, 0800,003D,0180,0A30,0000,128A :2006
U 1077, 0500,003C,D980,0A28,0084,7078 :2007
U 1078, 0003,0011,01C0,0800,0000,128A :2008
U 1079, 001C,0024,01C0,0800,0000,1259 :2009
U 1259, 081D,0030,0180,0800,0000,125A :2010
U 125A, 0200,003C,0180,0800,0000,125B :2011
U 125B, 0001,003E,0180,0AB8,0000,0001 :2012
:2013
:2014
:2015
:2016
:2017
U 125C, 0000,003C,0180,0A70,0000,125D :2018
U 125D, 0000,003C,0180,52F8,0000,125E :2019
U 125E, 0800,003C,69F0,2E78,0000,125F :2020
U 125F, 0018,0038,1980,0AF8,0000,1260 :2021
U 1260, 0000,003C,0180,0A70,0000,1261 :2022
U 1261, 001C,2000,0180,0800,0010,1262 :2023
U 1262, 0000,013C,0180,0800,0000,107A :2024
U 107A, 0001,003C,0180,09C8,0000,126B :2025

NOP
=0 CALL,J/DCE
RETURN1
: THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
: IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
: VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
: MME WILL BE SET HERE. UPON RETURN THE CONTENTS
: OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
: D AND Q ARE LOST.
: THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DC8
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWRA: ID[TBER0] D,D_R[8]
ID[TBUF] D
Q_ID[TBER1],RETURN1
: ROUTINE TO WRITE GROUP 0
=0
TBWRO: D_0,CALL,J/DC4
J7TBWR
: ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DC8
D_D.LEFT,SI/ZERO,J/TBWR
: THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D K[1],J/TBWRA
: THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
: THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
: R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
: TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
: R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC_K[9],LAB_R[5]
=0 ALU_MASK+1,Q_ALU,CALL,J/DC0
ALU_LA[ANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
: THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
: TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
: RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
: AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
: INDICATED IN R[E].
RELCHK: LAB_R[OE]
R[OF] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERENCE
Q_ID[TIME.ADDR],D_R[OF]
ALU_0(K),R[OF],ALU
LAB_R[OE]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?
=0 RC[9]_D,J/TBTRUE ; TRAPPED SO RETURN1.
```

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U 107B. 0000,003C,0180,0800,0000,107C :2026
U 107C. 0F00,003D,0180,0800,0000,1298 :2027
U 107D. 0500,003C,0180,0800,0000,1263 :2028
U 1263. 0001,003C,0180,0800,0082,1264 :2029
U 1264. 0803,0010,0180,0800,0000,1265 :2030
U 1265. 001D,2024,01C0,0800,0000,1266 :2031
U 1266. 0800,003C,0180,0A38,0000,1267 :2032
U 1267. 0001,003C,0180,09E0,0000,1268 :2033
U 1268. 0001,203C,0180,09D8,0000,1269 :2034
U 1269. 001D,2000,0180,0800,0010,126A :2035
U 126A. 0000,013C,0180,0800,0000,107E :2036
U 107E. 0000,003E,0180,0800,0000,0002 :2037
U 107F. 0000,003E,0180,0800,0000,0003 :2038
U 126B. 0000,003C,4DF0,2C00,0000,126C :2039
U 126C. 0001,203E,0180,09F0,0000,0001 :2040

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U 126D. 0000,003C,0180,0A70,0000,126E :2045
U 126E. 0000,003C,0180,52F8,0000,126F :2046
U 126F. 0800,003C,0180,0A78,0000,1270 :2047
U 1270. 0018,0038,1980,0AF8,0000,1271 :2048
U 1271. 0000,003C,0180,0A70,0000,1272 :2049
U 1272. 0001,003C,0180,09C8,0000,1273 :2050
U 1273. 001C,2000,0180,0800,0010,1274 :2051
U 1274. 0000,013C,0180,0800,0000,1080 :2052
U 1080. 0000,003C,0180,0800,0000,1275 :2053
U 1081. 0000,003E,0180,0800,0000,0001 :2054
U 1275. 0000,003C,D580,0800,0084,7276 :2055
U 1276. 0001,0024,0180,0800,0010,1277 :2056
U 1277. 0000,013C,4DF0,2C00,0000,1082 :2057
U 1082. 0001,203E,0180,09F0,0000,0002 :2058
U 1083. 0000,003E,0180,0800,0000,0003 :2059

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U 1278. 0000,003C,D580,0A70,0084,7279 :2066
U 1279. 0000,003C,0180,52F8,0000,127A :2067
U 127A. 0800,003C,49F0,2E78,0000,127B :2068
U 127B. 0018,0038,1980,0AF8,0000,127C :2069
U 127C. 0001,203C,0180,09E8,0000,127D :2070
U 127D. 0003,001C,0180,09F0,0000,127E :2071
U 127E. 0000,003C,0180,0A70,0000,127F :2072
U 127F. 001C,2000,0180,0800,0010,1280 :2073
U 1280. 0001,013C,0180,09C8,0000,1084 :2074
U 1084. 0000,003C,0180,0800,0000,1282 :2075
U 1085. 0001,2024,0180,0800,0010,1281 :2076
U 1281. 0000,013C,0180,0800,0000,1086 :2077
U 1086. 0000,003E,0180,0800,0000,0004 :2078
U 1087. 0000,003E,0180,0800,0000,0003 :2079
U 1282. 0000,003C,D580,0800,0084,7283 :2080

NOP
D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
D-D.LEFT,S1/ZERO
SC D
ALU_MASK+1,D,ALU
ALU_Q[ANDNOT]D,Q,ALU
D R[7] ; SEE IF ADDRESS RELOCATED
RC[0C]_D
RC[0B]_Q
ALU_Q-D,CLK.UBCC ; PROPERLY.
Z?
=0 RETURN2 ; INCORRECT.
RETURN3 ; OK
TBTRUE: Q_ID[TBER1]
RC[0E]_Q,RETURN1
: THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
: IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
: IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
: A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
MISS: LAB R[0E]
R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
D R[0F]
ALU_0(K),R[0F]_ALU
LAB R[0E]
RC[9]_D
ALU_L[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?
=0 J/MISSA
RETURN1 ; NO TRAP SO RETURN1.
MISSA: SC K[.6] ; IF A TRAP OCCURRED SEE
ALU_D,ANDNOT.MASK,CLK.UBCC ; IF IT WAS A TB MISS TRAP.
Z?,Q_ID[TBER1]
=0 RETURN2,RC[0E]_Q ; NOT TB MISS.
RETURN3 ; TB MISS.
: THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
: RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
: TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
: HIT/MISS BIT IN TBER0 IS INCORRECT.
: RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
: CHECK HIT IN GROUP 0.
HITO: LAB R[0E],SC K[.6]
HIT: R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
Q_ID[TBER0],D R[0F]
ALU_0(K),R[0F]_ALU
RC[0D]_Q
RC[0E]_ALU,ALU_NOT.MASK
LAB R[0E]
ALU_L[A-B]D,CLK.UBCC ; SEE IF TRAP OCCURRED.
Z?,RC[9]_D
=0 J/HITA ; TRAP OCCURRED.
ALU_Q,ANDNOT.MASK,CLK.UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?
Z?
=0 RETURN4 ; SET SO IT WAS A HIT.
RETURN3 ; CLEAR SO REFERENCE WAS A MISS.
HITA: SC_K[.6] ; TRAPPED, SO SEE IF TB MISS TRAP.
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U 1283, 0001,0024,0180,0800,0010,1284 :2081 ALU_D.ANDNOT.MASK,CLK.UBCC
U 1284, 0000,013C,0180,0800,0000,1088 :2082 Z?
U 1088, 0000,003C,0180,0800,0000,126B :2083 =0 J/TBTRUE ; NOT TB MISS TRAP.
U 1089, 0000,003E,0180,0800,0000,0002 :2084 RETURN2 ; TB MISS TRAP OCCURRED.
:2085 ; CHECK HIT IN GROUP 1.
U 1285, 0000,003C,5D80,0A70,0084,7279 :2086 HIT1: LAB RCOE],SC K[.7],J/HIT
:2087 ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1286, 0118,0038,1B80,0800,0000,129A :2088 S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1287, 0118,0038,0B80,0800,0000,129A :2089 S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1288, 0118,0038,0780,0800,0000,129A :2090 S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1289, 0118,0038,C380,0800,0000,129A :2091 S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 128A, 0018,0038,1980,0800,0000,1286 :2092 DC0: ALU_0(K),J/S00
U 128B, 0018,0038,1980,0800,0000,1287 :2093 DC1: ALU_0(K),J/S01
U 128C, 0018,0038,1980,0800,0000,1288 :2094 DC2: ALU_0(K),J/S10
U 128D, 0018,0038,1980,0800,0000,1289 :2095 DC3: ALU_0(K),J/S11
U 128E, 0018,0038,0980,0800,0000,1286 :2096 DC4: ALU_K[.2],J/S00
U 128F, 0018,0038,0980,0800,0000,1287 :2097 DC5: ALU_K[.2],J/S01
U 1290, 0018,0038,0980,0800,0000,1288 :2098 DC6: ALU_K[.2],J/S10
U 1291, 0018,0038,0980,0800,0000,1289 :2099 DC7: ALU_K[.2],J/S11
U 1292, 0018,0038,0580,0800,0000,1286 :2100 DC8: ALU_K[.1],J/S00
U 1293, 0018,0038,0580,0800,0000,1287 :2101 DC9: ALU_K[.1],J/S01
U 1294, 0018,0038,0580,0800,0000,1288 :2102 DCA: ALU_K[.1],J/S10
U 1295, 0018,0038,0580,0800,0000,1289 :2103 DCB: ALU_K[.1],J/S11
U 1296, 0018,0038,C180,0800,0000,1286 :2104 DCC: ALU_K[.FFFF],J/S00
U 1297, 0018,0038,C180,0800,0000,1287 :2105 DCD: ALU_K[.FFFF],J/S01
U 1298, 0018,0038,C180,0800,0000,1288 :2106 DCE: ALU_K[.FFFF],J/S10
U 1299, 0018,0038,C180,0800,0000,1289 :2107 DCF: ALU_K[.FFFF],J/S11
U 129A, 0100,003E,0380,0800,0000,0001 :2108 SX: D_D.LEFT2,SI/7,RETURN1
U 129B, 0018,0038,01C0,0800,0000,108A :2109 DC.5: Q_K[.8]
:2110 =0
U 108A, 0000,003D,0180,0800,0000,128F :2111 DC.5A: CALL,J/DC5
U 108B, 0019,2000,05C0,0800,0010,129C :2112 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 129C, 0000,013C,0180,0800,0000,108C :2113 Z?
U 108C, 0000,003C,0180,0800,0000,108A :2114 =0 J/DC.5A
U 108D, 0000,003E,0180,0800,0000,0001 :2115 RETURN1
:2116 =0
U 108E, 0000,003D,0180,0800,0000,129B :2117 DC.A: CALL,J/DC.5
U 108F, 0500,003E,0180,0800,0000,0001 :2118 D_D.LEFT,SI/ZERO,RETURN1
U 129D, 0018,0038,01C0,0800,0000,1090 :2119 DC.9: Q_K[.8]
:2120 =0
U 1090, 0000,003D,0180,0800,0000,1293 :2121 DC.9A: CALL,J/DC9
U 1091, 0019,2000,05C0,0800,0010,129E :2122 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 129E, 0000,013C,0180,0800,0000,1092 :2123 Z?
U 1092, 0000,003C,0180,0800,0000,1090 :2124 =0 J/DC.9A
U 1093, 0000,003E,0180,0800,0000,0001 :2125 RETURN1
:2126 =0
U 1094, 0000,003D,0180,0800,0000,129D :2127 DC.C: CALL,J/DC.9
U 1095, 0018,0038,C180,0800,0000,129F :2128 ALU_K[.FFFF]
U 129F, 0600,003E,0380,0800,0000,0001 :2129 D_D.RIGHT,SI/7,RETURN1
:2130 =0
U 1096, 0000,003D,0180,0800,0000,129D :2131 DC.6: CALL,J/DC.9
U 1097, 0018,0038,0580,0800,0000,12A0 :2132 ALU_K[.1]
U 12A0, 0100,003E,0380,0800,0000,0001 :2133 D_D.LEFT2,SI/7,RETURN1
:2134 =0
U 1098, 0000,003D,0180,0800,0000,129D :2135 DC.3: CALL,J/DC.9
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U 1099, 0018,0038,C180,0800,0000,12A1 :2136
U 12A1, 0500,003E,0380,0800,0000,0001 :2137

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U 12A2, 0F18,0038,0580,0800,0000,12A3 :2163
U 12A3, 0218,0038,0B80,0800,0000,12A4 :2164

U 12A4, 0218,0038,0B80,0800,0000,12A5 :2165
U 12A5, 0200,003C,0380,0800,0000,12A6 :2166

U 12A6, 0001,003C,0180,0AE0,0000,12A7 :2167
U 12A7, 0000,003C,6180,0800,0084,72A8 :2168

U 12A8, 0043,0010,0180,0AD8,0000,12A9 :2169
U 12A9, 081B,0000,0580,0800,0000,12AB :2170

U 12AB, 0018,0038,21C0,0800,0000,12AC :2171
U 12AC, 0019,2014,0580,0800,0082,12AD :2172

U 12AD, 0003,001C,01C0,0800,0000,12AE :2173
U 12AE, 001D,2014,0180,0AE8,0000,109A :2174

U 109A, 0000,003D,0180,0800,0000,129B :2175
U 109B, 0000,003C,0180,0A68,0000,12AF :2176

U 12AF, 081C,2034,0180,0800,0000,12B0 :2177
U 12B0, 081C,2030,0180,0A60,0000,12B1 :2178

U 12B1, 0001,003C,0180,0980,0000,109C :2179
U 109C, 0001,003D,0180,0AB0,0000,1094 :2180

U 109D, 0000,003C,0180,0A58,0000,12B2 :2181
U 12B2, 081C,2034,0180,0988,0000,109E :2182

U 109E, 0001,003D,0180,0AA8,0000,1076 :2183
U 109F, 0001,003C,0180,0990,0000,10A0 :2184

U 10A0, 0000,003D,0180,0800,0000,129D :2185
U 10A1, 0000,003C,0180,0A68,0000,12B3 :2186

U 12B3, 081C,2034,0180,0800,0000,12B4 :2187
U 12B4, 081C,2030,0180,0A60,0000,12B5 :2188

U 12B5, 0001,003C,0180,0998,0000,10A2 :2189
U 10A2, 0001,003D,0180,0AB0,0000,129B :2190

:2190

ALU_K[FFFF]
D D.LEFT,SI/7,RETURN1
: THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
: A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
: SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
: FOLLOWING DATA PATTERNS:

R[0B] 7FFFC000
R[0C] A4000000
R[0D] 001FFFFFF

RC[0] A4155555
RC[1] 4CCCC000
RC[2] 0AAAAA80

RC[3] A4199999
RC[4] 55554000
RC[5] 0CCCCC80

RC[6] A40AAAAA
RC[7] 33330000
RC[8] 05555500

R[0] A4066666
R[1] 2AAA8000
R[2] 03333300

TBWPTP: D_0,ALU_K[.1]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7
R[0C] D
SC_K[.F]
ALU_MASK+1,R[0B],ALU.RIGHT,SI/ZERO
D_0-K[.1]
Q_K[.14]
ALU_Q+K[.1],SC_ALU
ALU_NOT.MASK,Q-ALU
ALU_Q[A+B]D,R[0D],ALU
CALL,J/DC.5
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_A[OR]D,D_ALU
R[0] D
R[6] D,CALL,J/DC.C
LAB_R[0B]
ALU_LA[AND]D,D_ALU,RC[1],ALU
R[5] D,CALL,J/RELSUB
R[2] D
CALL,J/DC.9
LAB_R[0D]
ALU_LA[AND]D,D_ALU
LAB_R[0C],ALU_A[OR]D,D_ALU
R[3] D
R[6] D,CALL,J/DC.5

U 10A3, 0000,003C,0180,0A58,0000,12B6 :2191
U 12B6, 081C,2034,0180,09A0,0000,10A4 :2192
U 10A4, 0001,003D,0180,0AA8,0000,1076 :2193
U 10A5, 0001,003C,0180,09A8,0000,10A6 :2194
U 10A6, 0000,003D,0180,0800,0000,108E :2195
U 10A7, 0000,003C,0180,0A68,0000,12B7 :2196
U 12B7, 081C,2034,0180,0800,0000,12B8 :2197
U 12B8, 081C,2030,0180,0A60,0000,12B9 :2198
U 12B9, 0001,003C,0180,09B0,0000,10A8 :2199
U 10A8, 0001,003D,0180,0AB0,0000,1098 :2200
U 10A9, 0000,003C,0180,0A58,0000,12BA :2201
U 12BA, 081C,2034,0180,09B8,0000,10AA :2202
U 10AA, 0001,003D,0180,0AA8,0000,1076 :2203
U 10AB, 0001,003C,0180,09C0,0000,10AC :2204
U 10AC, 0000,003D,0180,0800,0000,1096 :2205
U 10AD, 0000,003C,0180,0A68,0000,12BB :2206
U 12BB, 081C,2034,0180,0800,0000,12BC :2207
U 12BC, 081C,2030,0180,0A60,0000,12BD :2208
U 12BD, 0001,003C,0180,0A80,0000,10AE :2209
U 10AE, 0001,003D,0180,0AB0,0000,108E :2210
U 10AF, 0000,003C,0180,0A58,0000,12BE :2211
U 12BE, 081C,2034,0180,0A88,0000,10B0 :2212
U 10B0, 0001,003D,0180,0AA8,0000,1076 :2213
U 10B1, 0001,003E,0180,0A90,0000,0001 :2214
:2215
:2216
:2217
U 12BF, 0000,003F,0180,0800,0000,117C :2218
U 117C, 0000,003E,0180,0800,0000,0001 :2219
U 117D, 0000,003E,0180,0800,0000,0002 :2220
U 117E, 0000,003E,0180,0800,0000,0003 :2221
U 117F, 0000,003E,0180,0800,0000,0004 :2222
U 11FC, 0000,003D,0180,0800,0000,1243 :2223
U 11FD, 0000,003D,0180,0800,0000,1243 :2224
U 11FE, 0000,003D,0180,0800,0000,1243 :2225
U 11FF, 0000,003D,0180,0800,0000,1243 :2226
:2227
:2228
:2229
U 1008, 0000,003E,0180,2AF8,0000,0001 :2230
U 1009, 0000,003E,0180,32F8,0000,0001 :2231
U 100A, 0000,003E,0180,42F8,0000,0001 :2232
U 100B, 0000,003E,0180,4AF8,0000,0001 :2233
U 100C, 0000,003E,0180,52F8,0000,0001 :2234
U 100D, 0000,003E,0180,5AF8,0000,0001 :2235
U 100E, 0000,003E,0180,6AF8,0000,0001 :2236
U 100F, 0000,003E,0180,72F8,0000,0001 :2237
:2238
:2239
:2240
U 1004, 0000,003E,0180,02F8,0000,0001 :2241
U 1005, 0000,003E,0180,0AF8,0000,0001 :2242
U 1006, 0000,003E,0180,12F8,0000,0001 :2243
U 1007, 0000,003E,0180,62F8,0000,0001 :2244
:2245

LAB_R[0B]
ALU_LA[AND]D,D,ALU,RC[4]_ALU
R[5]_D,CALL,J/RELSUB
R[5]_D
CALL,J/DC.A
LAB_R[0D]
ALU_LA[AND]D,D,ALU
LAB_R[0C],ALU_LA[OR]D,D,ALU
R[6]_D
R[6]_D,CALL,J/DC.3
LAB_R[0B]
ALU_LA[AND]D,D,ALU,RC[7]_ALU
R[5]_D,CALL,J/RELSUB
R[6]_D
CALL,J/DC.6
LAB_R[0D]
ALU_LA[AND]D,D,ALU
LAB_R[0C],ALU_LA[OR]D,D,ALU
R[0]_D
R[6]_D,CALL,J/DC.A
LAB_R[0B]
ALU_LA[AND]D,D,ALU,RC[1]_ALU
R[5]_D,CALL,J/RELSUB
R[2]_D,RETURN1
; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
; WHICH COULD RESULT IN ERROR CONDITIONS.
TARGC3: SUB/SPEC
117C: RETURN1
117D: RETURN2
117E: RETURN3
117F: RETURN4
11FC: ERROR1
11FD: ERROR1
11FE: ERROR1
11FF: ERROR1
; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH ENABLE
; TB MISS UTRAPS
=000
TBTAB0: R[0F]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH DISABLE
; TB MISS UTRAPS.
=00
TBTAB1: R[0F]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
R[0F]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
R[0F]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH DISABLE

U 1010.	0000	.003E	.0180	.82F8	.0000	.0001	:2246
U 1011.	0000	.003E	.0180	.8AF8	.0000	.0001	:2247
U 1012.	0000	.003E	.0180	.92F8	.0000	.0001	:2248
U 1013.	0000	.003E	.0180	.9AF8	.0000	.0001	:2249
U 1014.	0000	.003E	.0180	.A2F8	.0000	.0001	:2250
U 1015.	0000	.003E	.0180	.AAF8	.0000	.0001	:2251
U 1016.	0000	.003E	.0180	.BAF8	.0000	.0001	:2252
U 1017.	0000	.003E	.0180	.CAF8	.0000	.0001	:2253
U 1018.	0000	.003E	.0180	.DAF8	.0000	.0001	:2254
U 1019.	0000	.003E	.0180	.EAF8	.0000	.0001	:2255
U 101A.	0000	.003E	.0180	.FAF8	.0000	.0001	:2256
U 101B.	0000	.003E	.0180	.5EF8	.0000	.0001	:2257
U 101C.	0000	.003E	.0180	.DEF8	.0000	.0001	:2258
							:2259
							:2260
							:2261
							:2262
							:2263
							:2264
							:2265
							:2266
U 1040.	0000	.003E	.0180	.32F8	.0000	.0001	:2267
U 1041.	0000	.003E	.0180	.42F8	.0000	.0001	:2268
U 1042.	0000	.003E	.0180	.52F8	.0000	.0001	:2269
U 1043.	0000	.003E	.0180	.5AF8	.0000	.0001	:2270
U 1044.	0000	.003E	.0180	.72F8	.0000	.0001	:2271
							:2272
							:2273
							:2274
							:2275
U 1050.	0000	.003E	.0180	.02F8	.0000	.0001	:2276
U 1051.	0000	.003E	.0180	.0AF8	.0000	.0001	:2277
U 1052.	0000	.003E	.0180	.12F8	.0000	.0001	:2278
U 1053.	0000	.003E	.0180	.2AF8	.0000	.0001	:2279
U 1054.	0000	.003E	.0180	.4AF8	.0000	.0001	:2280
U 1055.	0000	.003E	.0180	.62F8	.0000	.0001	:2281
U 1056.	0000	.003E	.0180	.6AF8	.0000	.0001	:2282
							:2283
							:2284
							:2285
							:2286
							:2287
U 102C.	0000	.003E	.0180	.32F8	.0000	.0001	:2288
U 102D.	0000	.003E	.0180	.52F8	.0000	.0001	:2289
U 102E.	0000	.003E	.0180	.72F8	.0000	.0001	:2290
							:2291
							:2292
							:2293
							:2294
U 1060.	0000	.003E	.0180	.02F8	.0000	.0001	:2295
U 1061.	0000	.003E	.0180	.0AF8	.0000	.0001	:2296
U 1062.	0000	.003E	.0180	.12F8	.0000	.0001	:2297
U 1063.	0000	.003E	.0180	.2AF8	.0000	.0001	:2298
U 1064.	0000	.003E	.0180	.42F8	.0000	.0001	:2299
U 1065.	0000	.003E	.0180	.4AF8	.0000	.0001	:2300

```

: UTRAPS CAUSED BY:
: TB MISS, ACCESS VIOLATION, XPAGE, ALIGNMENT, MODIFY BIT AND
: TB PARITY ERRORS.
=0000
TBTAB2: R[OF]_LA,FS/MCT,MCT/SBI.HOLD,RETURN1
R[OF]_LA,FS/MCT,MCT/SBI.HOLD+UNJAM,RETURN1
R[OF]_LA,FS/MCT,MCT/INVALIDATE,RETURN1
R[OF]_LA,FS/MCT,MCT/VALIDATE,RETURN1
R[OF]_LA,FS/MCT,MCT/EXTWRITE.P,RETURN1
R[OF]_LA,FS/MCT,MCT/WRITE.P,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKWRITE.P,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.P,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.INT.SUM,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKREAD.P,RETURN1
R[OF]_LA,FS/MCT,MCT/ALLOW.IB.READ,RETURN1
R[OF]_LA,MCT/17,RETURN1
R[OF]_LA,MCT/37,RETURN1
=
: THIS IS A TABLE OF MCT FUNCTION WHICH WILL ENABLE
: READ OR WRITE ACCESS VIOLATIONS IN THE TB.
=000
TBTAB3: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
=
: THIS IS A TABLE FOR TESTING MCT FUNCTIONS THAT DISABLE ACCESS
: VIOLATION CHECKS WITH ACCESS CODES WHICH ALLOW NO ACCESS.
=000
TBTAB4: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
=
: THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE UTRAPS
: ON ACCESS VIOLATIONS WHEN THE ACCESS CODE ALLOWS FOR
: READ ONLY ACCESS.
=00
TBTAB5: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
=
: THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH DISABLE
: ACCESS VIOLATION TRAPS WITH ACCESS CODES ALLOWING READ ONLY.
=000
TBTAB6: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1

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U 1066,	0000,003E,0180,62F8,0000,0001	:2301
U 1067,	0000,003E,0180,6AF8,0000,0001	:2302
		:2303
		:2304
		:2305
		:2306
U 103C,	0000,003E,0180,32F8,0000,0001	:2307
U 103D,	0000,003E,0180,52F8,0000,0001	:2308
U 103E,	0000,003E,0180,72F8,0000,0001	:2309
		:2310
		:2311
		:2312
		:2313
U 1068,	0000,003E,0180,02F8,0000,0001	:2314
U 1069,	0000,003E,0180,0AF8,0000,0001	:2315
U 106A,	0000,003E,0180,12F8,0000,0001	:2316
U 106B,	0000,003E,0180,2AF8,0000,0001	:2317
U 106C,	0000,003E,0180,42F8,0000,0001	:2318
U 106D,	0000,003E,0180,4AF8,0000,0001	:2319
U 106E,	0000,003E,0180,62F8,0000,0001	:2320
U 106F,	0000,003E,0180,6AF8,0000,0001	:2321
		:2322
		:2323
		:2324
U 1048,	0000,003E,0180,32F8,0000,0001	:2325
U 1049,	0000,003E,0180,42F8,0000,0001	:2326
U 104A,	0000,003E,0180,52F8,0000,0001	:2327
U 104B,	0000,003E,0180,5AF8,0000,0001	:2328
		:2329
		:2330
		:2331
U 1020,	0000,003E,0180,02F8,0000,0001	:2332
U 1021,	0000,003E,0180,0AF8,0000,0001	:2333
U 1022,	0000,003E,0180,12F8,0000,0001	:2334
U 1023,	0000,003E,0180,32F8,3000,0001	:2335
U 1024,	0000,003E,0180,32F8,3400,0001	:2336
U 1025,	0000,003E,0180,42F8,3000,0001	:2337
U 1026,	0000,003E,0180,42F8,3400,0001	:2338
U 1027,	0000,003E,0180,52F8,3000,0001	:2339
U 1028,	0000,003E,0180,52F8,3400,0001	:2340
U 1029,	0000,003E,0180,62F8,0000,0001	:2341
		:2342
		:2343
		:2344
		:2345
U 1030,	0000,003E,0180,02F8,0000,0001	:2346
U 1031,	0000,003E,0180,12F8,0000,0001	:2347
U 1032,	0000,003E,0180,2AF8,0000,0001	:2348
U 1033,	0000,003E,0180,32F8,0000,0001	:2349
U 1034,	0000,003E,0180,3AF8,0000,0001	:2350
U 1035,	0000,003E,0180,42F8,0000,0001	:2351
U 1036,	0000,003E,0180,4AF8,0000,0001	:2352
U 1037,	0000,003E,0180,52F8,0000,0001	:2353
U 1038,	0000,003E,0180,5AF8,0000,0001	:2354
U 1039,	0000,003E,0180,6AF8,0000,0001	:2355

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R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
=
; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE MODIFY
; BIT UTRAPS.
=00
TBTAB7: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
=
; THIS IS A TABLE USED TEST MCT FUNCTIONS WHICH DISABLE TB
; MODIFY BIT UTRAPS.
=000
TBTAB8: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
        R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
        R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE
; ALIGNMENT AND XPAGE ERROR1
=00
TBTAB9: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH DISABLE
; UTRAPS ON ALIGNMENT ERRORS AND XPAGE ERRORS.
=0000
TBTABA: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,MSC/NOP,RETURN1
        R[OF]_LA,FS/MCT,MCT/MEM.NOP,MSC/NOP,RETURN1
        R[OF]_LA,FS/MCT,MCT/TEST.WCHK,MSC/NOP,RETURN1
        R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,MSC/SECOND.REF,RETURN1
        R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,MSC/RETRY.NO.TRAP,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,MSC/SECOND.REF,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,MSC/RETRY.NO.TRAP,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,MSC/RETRY.NO.TRAP,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
=
; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE
; TB PARITY ERROR UTRAPS.
=0000
TBTABB: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/LOCKWRITE.V.XCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
        R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1

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U 103A, 0000,003E,0180,72F8,0000,0001 ;2356

;2356

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R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
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:2357

; THIS IS A TABLE WHICH IS USED TO TEST MCT FUNCTIONS WHICH DISABLE
; TB PARITY ERROR UTRAPS.

2358

:2359

: 2360
: 2341


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TBTABC: R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
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R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1

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U	10BA.	0000	003D	0180	0800	0000	1247
U	10BB.	0000	003C	0180	0800	0000	10BC
U	10BC.	0000	003D	0180	0800	0000	1242
U	10BD.	0018	0038	0580	0800	0200	12C4
U	12C4.	0800	003C	0180	0A00	0000	12C5
U	12C5.	0000	003C	3D80	3C00	0000	12C6
U	12C6.	0000	003C	0180	1C00	0000	12C7
U	12C7.	0000	003C	0180	0A70	0000	12C8
U	12C8.	0000	003C	0180	0AF8	0000	12C9
U	12C9.	0000	803C	0180	5000	0C00	12CA
U	12CA.	0800	003C	0180	0A78	0000	12CB
U	12CB.	0003	003C	0180	0AF8	0000	12CC
U	12CC.	0001	003C	0180	09F0	0000	12CD
U	12CD.	0000	003C	01C0	0A70	0000	12CE
U	12CE.	001D	2000	0180	0800	0010	12CF
U	12CF.	0000	013C	0180	0800	0000	10BE
U	10BE.	0C00	003C	0180	0800	0000	12D0
U	10BF.	0000	003D	0180	0800	0000	1243
U	12D0.	001C	2034	0180	0A08	0010	12D1
U	12D1.	0000	013C	0180	0800	0000	10C0
U	10C0.	0000	003D	0180	0800	0000	1243
U	10C1.	0000	003C	0180	0800	0000	10C2

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2364 .PAGE "TEST BE ODD ADDRESS UTRAP TEST 1"
2365 *****
2366 ++
2367 TEST BE ODD ADDRESS UTRAP TEST 1
2368
2369 TEST DESCRIPTION
2370 THIS IS A TEST OF ODD ADDRESS UTRAPS
2371 USING CONDITIONS WHICH SHOULD RESULT IN ODD ADDRESS UTRAPS.
2372 CONDITIONS TESTED ARE:
2373 SUBTEST 1 VA=1,DT/BYTE,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
2374 SUBTEST 2 VA=1,DT/WORD,MSC/NOP,MCT/READ.V.WCHK
2375
2376 ERROR DESCRIPTION
2377 UTRAP FLAG
2378 --
2379 *****
2380 =0
2381 ODDA: NEWTST
2382 RC[OF],K[.1],D,0
2383 =0 ID[TBER0],D,CA[L,J/CSOFF
2384 SC,K[.1F]
2385 ALD,NOT.MASK,R[0],ALU,SC,K[.10]
2386 ALU,NOT.MASK,R[1],ALU
2387 =0 D,0,CALL,J/DC.DE
2388 SC,K[.10]
2389 ALD,D,ORNOT.MASK,R[OE],ALU
2390 RC[OF],0
2391 :////////////////////
2392 +
2393 SUBTEST 1
2394 VA=1,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,DT/BYTE
2395 -
2396 =0 SUBTEST
2397 NOP
2398 =0 ERLOOP
2399 ODDA1: VA,K[.1]
2400 D,R[0]
2401 ID[PSL],D
2402 CID/CONT
2403 LAB,R[OE]
2404 RC[OF],LA
2405 DT/BYTE,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK ; SHOULD UTRAP
2406 D,R[OF]
2407 RC[OF],0
2408 RC[OE],D
2409 Q,R[OE]
2410 A[U,Q-D,CLK.UBCC
2411 Z?
2412 =0 J/ODDA2
2413 ERROR1 ; NO UTRAP
2414 ODDA2: LAB,R[1],ALU,LA[AND],D,CLK.UBCC
2415 Z?
2416 =0 ERROR1
2417 NOP
2418 :////////////////////

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U 10C2, 0000,003D,0180,0800,0000,1247
U 10C3, 0000,003C,0180,0800,0000,10C4
U 10C4, 0000,003D,0180,0800,0000,1242
U 10C5, 0018,0038,0580,0800,0200,12D2
U 12D2, 0800,003C,0180,0A00,0000,12D3
U 12D3, 0000,003C,3D80,3C00,0000,12D4
U 12D4, 0000,003C,0180,1C00,0000,12D5
U 12D5, 0000,003C,0180,0A70,0000,12D6
U 12D6, 0000,003C,0180,0AF8,0000,12D7
U 12D7, 0000,403C,0180,5000,0000,12D8
U 12D8, 0800,003C,0180,0A78,0000,12D9
U 12D9, 0003,003C,0180,0AF8,0000,12DA
U 12DA, 0001,003C,0180,09F0,0000,12DB
U 12DB, 0000,003C,01C0,0A70,0000,12DC
U 12DC, 001D,2000,0180,0800,0010,12DD
U 12DD, 0000,013C,0180,0800,0000,10C6
U 10C6, 0000,003C,0180,0800,0000,12DE
U 10C7, 0000,003D,0180,0800,0000,1243
U 12DE, 001C,2034,0180,0A08,0010,12DF
U 12DF, 0000,013C,0180,0800,0000,10C8
U 10C8, 0000,003D,0180,0800,0000,1243
U 10C9, 0000,003C,0180,0800,0000,10CA

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```

:2445 .PAGE "TEST BF ODD ADDRESS UTRAP TEST 2"
:2446 *****
:2447 ++
:2448 TEST BF ODD ADDRESS UTRAP TEST 2
:2449
:2450 TEST DESCRIPTION
:2451 THIS IS A TEST OF THE ODD ADDRESS DETECTION LOGIC
:2452 USING CONDITIONS EACH OF WHICH SHOULD INHIBIT AN
:2453 ODD ADDRESS UTRAP FROM OCCURRING.
:2454 CONDITIONS TESTED INCLUDE:
:2455 SUBTEST 1 VA=1,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,NOT.CONSOLE,NOT.CM
:2456 SUBTEST 2 VA=0,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,NOT.CONSOLE,CM
:2457 SUBTEST 3 VA=1,CM,NOT.CONSOLE,DT/BYTE,MSC/NOP,MCT/READ.V.WCHK
:2458 SUBTEST 4 VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/INH.CM.ADDR,MCT/READ.V.WCHK
:2459 SUBTEST 5 VA=1,CM,CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
:2460 SUBTEST 6 VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.P
:2461
:2462 ERROR DESCRIPTION
:2463 UTRAP FLAG
:2464
:2465 --
:2466 *****
:2467 =0
:2468 ODD8: NEWTST
:2469 RC[OF] K[.1],D_0
:2470 =0 ID[TERO]_D,CALL,J/COFF
:2471 SC_K[.1F]
:2472 ALU_NOT.MASK,R[0]_ALU,SC_K[.10]
:2473 ALU_NOT.MASK,R[1]_ALU
:2474 =0 D_0,CALL,J/DC.DE
:2475 SC_K[.10]
:2476 ALU_D.ORNOT.MASK,R[OE]_ALU
:2477 R[OF]_0
:2478 //////////////////////////////////////
:2479 +
:2480 SUBTEST 1
:2481 VA=1,NOT.CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
:2482
:2483 =0 SUBTEST
:2484 NOP
:2485 =0 ERLOOP
:2486 ODD81: VA_K[.1],D_0
:2487 ID[PSL]_D
:2488 CID/CONT
:2489 LAB_R[OE]
:2490 R[OF]_LA
:2491 DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
:2492 D_R[OF]
:2493 R[OF]_0
:2494 R[OE]_D
:2495 Q_R[OE]
:2496 ACU_Q-D,CLK_UBCC
:2497 Z?
:2498 =0 J/ODDB2 ; A UTRAP OCCURRED.
:2499 J/ODDB3 ; NO UTRAP OCCURRED.

```

```

J 10CA, 0000,003D,0180,0800,0000,122F
U 10CB, 0F18,0038,0580,09F8,0000,10CC
U 10CC, 0000,003D,4980,3C00,0000,124C
U 10CD, 0000,003C,8D80,0800,0084,72E0
U 12E0, 0003,001C,6580,0A80,0084,72E1
U 12E1, 0003,001C,0180,0A88,0000,10CE
U 10CE, 0F00,003D,0180,0800,0000,1046
U 10CF, 0000,003C,6580,0800,0084,72E2
U 12E2, 0001,001C,0180,0AF0,0000,12E3
U 12E3, 0003,003C,0180,0AF8,0000,10D0

```

```

U 10D0, 0000,003D,0180,0800,0000,1247
U 10D1, 0000,003C,0180,0800,0000,10D2
U 10D2, 0000,003D,0180,0800,0000,1242
U 10D3, 0F18,0038,0580,0800,0200,12E4
U 12E4, 0000,003C,3D80,3C00,0000,12E5
U 12E5, 0000,003C,0180,1C00,0000,12E6
U 12E6, 0000,003C,0180,0A70,0000,12E7
U 12E7, 0000,003C,0180,0AF8,0000,12E8
U 12E8, 0000,403C,0180,5000,0C00,12E9
U 12E9, 0800,003C,0180,0A78,0000,12EA
U 12EA, 0003,003C,0180,0AF8,0000,12EB
U 12EB, 0001,003C,0180,09F0,0000,12EC
U 12EC, 0000,003C,01C0,0A70,0000,12ED
U 12ED, 001D,2000,0180,0800,0010,12EE
U 12EE, 0000,013C,0180,0800,0000,10D4
U 10D4, 0000,003C,0180,0800,0000,12EF
U 10D5, 0000,003C,0180,0800,0000,10D8

```

U	12EF,	001C,	2034,	0180,	0A08,	0010,	12F0	:2500
U	12F0,	0000,	013C,	0180,	0800,	0000,	10D6	:2501
U	10D6,	0000,	003D,	0180,	0800,	0000,	1243	:2502
U	10D7,	0000,	003D,	0180,	0800,	0000,	1243	:2503
								:2504
								:2505
								:2506
								:2507
								:2508
								:2509
U	10D8,	0000,	003D,	0180,	0800,	0000,	1247	:2510
U	10D9,	0000,	003C,	0180,	0800,	0000,	10DA	:2511
U	10DA,	0000,	003D,	0180,	0800,	0000,	1242	:2512
U	10DB,	0018,	0038,	1980,	0800,	0200,	12F1	:2513
U	12F1,	0800,	003C,	0180,	0A00,	0000,	12F2	:2514
U	12F2,	0000,	003C,	3D80,	3C00,	0000,	12F3	:2515
U	12F3,	0000,	003C,	0180,	1C00,	0000,	12F4	:2516
U	12F4,	0000,	003C,	0180,	0A70,	0000,	12F5	:2517
U	12F5,	0000,	003C,	0180,	0AF8,	0000,	12F6	:2518
U	12F6,	0000,	403C,	0180,	5000,	0C00,	12F7	:2519
U	12F7,	0800,	003C,	0180,	0A78,	0000,	12F8	:2520
U	12F8,	0003,	003C,	0180,	0AF8,	0000,	12F9	:2521
U	12F9,	0001,	003C,	0180,	09F0,	0000,	12FA	:2522
U	12FA,	0000,	003C,	01C0,	0A70,	0000,	12FB	:2523
U	12FB,	001D,	2000,	0180,	0800,	0010,	12FC	:2524
U	12FC,	0000,	013C,	0180,	0800,	0000,	10DC	:2525
U	10DC,	0000,	003C,	0180,	0800,	0000,	12FD	:2526
U	10DD,	0000,	003C,	0180,	0800,	0000,	10E0	:2527
U	12FD,	001C,	2034,	0180,	0A08,	0010,	12FE	:2528
U	12FE,	0000,	013C,	0180,	0800,	0000,	10DE	:2529
U	10DE,	0000,	003D,	0180,	0800,	0000,	1243	:2530
U	10DF,	0000,	003D,	0180,	0800,	0000,	1243	:2531

```

ODDB2:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
        Z?
=0      ERROR1          ; UTRAPPED, NON ODD ADDRESS ERROR.
        ERROR1          ; ODD ADDRESS UTRAP OCCURRED.
        ;////////////////////
        ;+
        SUBTEST          2
        VA=0,CM,NOT.CONSOLE,MSC/CHK.ODD.ADD,MCT/READ.V.WCHK
        ;-
=0
ODDB3:  SUBTEST
        NOP
=0      ERLOOP
        VA K[ZERO]
        D R[0]
        ID[PSL] D
        CID/CONT
        LAB R[OE]
        R[OF] LA
        DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
        D R[OF]
        R[OF] 0
        RC[OE] D
        Q R[OE]
        ALU_Q-D,CLK.UBCC
        Z?
=0      J/ODDB4          ; A UTRAP OCCURRED.
        J/ODDB5          ; NO UTRAP OCCURRED.
ODDB4:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
        Z?
=0      ERROR1          ; UTRAPPED, NON ODD ADDRESS ERROR.
        ERROR1          ; ODD ADDRESS UTRAP OCCURRED.

```

U 10E0,	0000,003D,0180,0800,0000,1247	:2538
U 10E1,	0000,003C,0180,0800,0000,10E2	:2539
U 10E2,	0000,003D,0180,0800,0000,1242	:2540
U 10E3,	0018,0038,0580,0800,0200,12FF	:2541
U 12FF,	0800,003C,0180,0A00,0000,1300	:2542
U 1300,	0000,003C,3D80,3C00,0000,1301	:2543
U 1301,	0000,003C,0180,1C00,0000,1302	:2544
U 1302,	0000,003C,0180,0A70,0000,1303	:2545
U 1303,	0000,003C,0180,0AF8,0000,1304	:2546
U 1304,	0000,803C,0180,5000,0000,1305	:2547
U 1305,	0800,003C,0180,0A78,0000,1306	:2548
U 1306,	0G03,003C,0180,0AF8,0000,1307	:2549
U 1307,	0001,003C,0180,09F0,0000,1308	:2550
U 1308,	0000,003C,01C0,0A70,0000,1309	:2551
U 1309,	001D,2000,0180,0800,0010,130A	:2552
U 130A,	0000,013C,0180,0800,0000,10E4	:2553
U 10E4,	0000,003C,0180,0800,0000,130B	:2554

```

=0 ODD85: SUBTEST
NOP
ERLOOP
VA K[.1]
D R[0]
ID[PSL] D
CID/CONT
LAB R[OE]
R[OF] LA
DT/BYTE, MSC/NOP, I'S/MCT, MCT/READ.V.WCHK
D R[OF]
R[OF] 0
RC[OE] D
Q R[OE]
ACU_Q-D, CLK.UBCC
Z?
=0 J/ODDB6 : A UTRAP OCCURRED.

```

CCCCCCCCCCCCCCCC


```

U 10E5, 0000,003C,0180,0800,0000,10E8 :2555
U 130B, 001C,2034,0180,0A08,0010,130C :2556
U 130C, 0000,013C,0180,0800,0000,10E6 :2557
U 10E6, 0000,003D,0180,0800,0000,1243 :2558
U 10E7, 0000,003D,0180,0800,0000,1243 :2559
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U 10E8, 0000,003D,0180,0800,0000,1247 :2566
U 10E9, 0000,003C,0180,0800,0000,10EA :2567
U 10EA, 0000,003D,0180,0800,0000,1242 :2568
U 10EB, 001E,0038,0580,0800,0200,130D :2569
U 130D, 0800,003C,0180,0A00,0000,130E :2570
U 130E, 0000,003C,3D80,3C00,0000,130F :2571
U 130F, 0000,003C,0180,1C00,0000,1310 :2572
U 1310, 0000,003C,0180,0A70,0000,1311 :2573
U 1311, 0000,003C,0180,0AF8,0000,1312 :2574
U 1312, 0000,403C,0180,5000,3C00,1313 :2575
U 1313, 0800,003C,0180,0A78,0000,1314 :2576
U 1314, 0003,003C,0180,0AF8,0000,1315 :2577
U 1315, 0001,003C,0180,09F0,0000,1316 :2578
U 1316, 0000,003C,01C0,0A70,0000,1317 :2579
U 1317, 001D,2000,0180,0800,0010,1318 :2580
U 1318, 0000,013C,0180,0800,0000,10EC :2581
U 10EC, 0000,003C,0180,0800,0000,1319 :2582
U 10ED, 0000,003C,0180,0800,0000,10F0 :2583
U 1319, 001C,2034,0180,0A08,0010,131A :2584
U 131A, 0000,013C,0180,0800,0000,10EE :2585
U 10EE, 0000,003D,0180,0800,0000,1243 :2586
U 10EF, 0000,003D,0180,0800,0000,1243 :2587
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U 10F0, 0000,003D,0180,0800,0000,1247 :2594
U 10F1, 0000,003C,0180,0800,0000,10F2 :2595
U 10F2, 0000,003D,0180,0800,0000,1242 :2596
U 10F3, 0018,0038,0580,0800,0200,131B :2597
U 131B, 0800,003C,0180,0A00,0000,131C :2598
U 131C, 0000,003C,3D80,3C00,0000,131D :2599
U 131D, 0000,003C,0180,1400,0000,131E :2600
U 131E, 0000,003C,0180,0A70,0000,131F :2601
U 131F, 0000,003C,0180,0AF8,0000,1320 :2602
U 1320, 0000,403C,0180,5000,0C00,1321 :2603
U 1321, 0000,003C,0180,1C00,0000,1322 :2604
U 1322, 0800,003C,0180,0A78,0000,1323 :2605
U 1323, 0003,003C,0180,0AF8,0000,1324 :2606
U 1324, 0001,003C,0180,09F0,0000,1325 :2607
U 1325, 0000,003C,01C0,0A70,0000,1326 :2608
U 1326, 001D,2000,0180,0800,0010,1327 :2609

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J/ODDB7 : NO UTRAP OCCURRED.
ODDB6: LAB_R[1],ALU_LA[AND]D,CLK.UBCC
Z?
=0 ERROR1 : UTRAPPED, NON ODD ADDRESS ERROR.
ERROR1 : ODD ADDRESS UTRAP OCCURRED.
:////////////////////
:
: SUBTEST 4
: VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/INH.CM.ADDR,MCT/READ.V.WCHK
:-
=0
ODDB7: SUBTEST
NOP
ERLOOP
VA_K[.1]
D_R[0]
ID[PSL]_D
CID/CONT
LAB_R[OE]
R[OF]_LA
DT/WORD,MSC/INH.CM.ADDR,FS/MCT,MCT/READ.V.WCHK
D_R[OF]
R[OF]_0
RC[OE]_D
Q_R[OE]
ALU_Q-D,CLK.UBCC
Z?
=0 J/ODDB8 : A UTRAP OCCURRED.
J/ODDB9 : NO UTRAP OCCURRED.
ODDB8: LAB_R[1],ALU_LA[AND]D,CLK.UBCC
Z?
=0 ERROR1 : UTRAPPED, NON ODD ADDRESS ERROR.
ERROR1 : ODD ADDRESS UTRAP OCCURRED.
:////////////////////
:
: SUBTEST 5
: VA=1,CM,CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
:-
=0
ODDB9: SUBTEST
NOP
ERLOOP
VA_K[.1]
D_R[0]
ID[PSL]_D
CID/ACK
LAB_R[OE]
R[OF]_LA
DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
CID/CONT
D_R[OF]
R[OF]_0
RC[OE]_D
Q_R[OE]
ALU_Q-D,CLK.UBCC

```

```

U 1327, 0000,013C,0180,0800,0000,10F4 :2610
U 10F4, 0000,003C,0180,0800,0000,1328 :2611
U 10F5, 0000,003C,0180,0800,0000,10F8 :2612
U 1328, 001C,2034,0180,0A08,0010,1329 :2613
U 1329, 0000,013C,0180,0800,0000,10F6 :2614
U 10F6, 0000,003D,0180,0800,0000,1243 :2615
U 10F7, 0000,003D,0180,0800,0000,1243 :2616
:2617
:2618
:2619
:2620
:2621
:2622
U 10F8, 0000,003D,0180,0800,0000,1247 :2623
U 10F9, 0000,003C,0180,0800,0000,10FA :2624
U 10FA, 0000,003D,0180,0800,0000,1242 :2625
U 10FB, 0018,0038,0580,0800,0200,132A :2626
U 132A, 0800,003C,0180,0A00,0000,132B :2627
U 132B, 0000,003C,3D80,3C00,0000,132C :2628
U 132C, 0000,003C,0180,1C00,0000,132D :2629
U 132D, 0000,003C,0180,0A70,0000,132E :2630
U 132E, 0000,003C,0180,0AF8,0000,132F :2631
U 132F, 0000,403C,0180,C800,0C00,1330 :2632
U 1330, 0800,003C,0180,0A78,0000,1331 :2633
U 1331, 0003,003C,0180,0AF8,0000,1332 :2634
U 1332, 0001,003C,0180,09F0,0000,1333 :2635
U 1333, 0000,003C,01C0,0A70,0000,1334 :2636
U 1334, 001D,2000,0180,0800,0010,1335 :2637
U 1335, 0000,013C,0180,0800,0000,10FC :2638
U 10FC, 0000,003C,0180,0800,0000,1336 :2639
U 10FD, 0000,003C,0180,0800,0000,1338 :2640
U 1336, 001C,2034,0180,0A08,0010,1337 :2641
U 1337, 0000,013C,0180,0800,0000,10FE :2642
U 10FE, 0000,003D,0180,0800,0000,1243 :2643
U 10FF, 0000,003D,0180,0800,0000,1243 :2644
U 1338, 0000,003C,0180,0800,0000,110A :2645

```

```

Z?
=0 J/ODDB10 : A UTRAP OCCURRED.
J/ODDB11 : NO UTRAP OCCURRED.
ODDB10: LAB_R[1],ALU_LA[AND]D,CLK.UBCC
Z?
=0 ERROR1 : UTRAPPED, NON ODD ADDRESS ERROR.
ERROR1 : ODD ADDRESS UTRAP OCCURRED.
////////////////////////////////////
+
SUBTEST 6
VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.P
-
=0
ODDB11: SUBTEST
NOP
=0 ERLOOP
VA_K[.1]
D_R[0]
ID[PSL] D
CID/CONT
LAB_R[OE]
R[OF] LA
DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.P
D_R[OF]
R[OF] 0
R[OE] D
Q_R[OE]
A[U_Q-D,CLK.UBCC
Z?
=0 J/ODDB12 : A UTRAP OCCURRED.
J/ODDB13 : NO UTRAP OCCURRED.
ODDB12: LAB_R[1],ALU_LA[AND]D,CLK.UBCC
Z?
=0 ERROR1 : UTRAPPED, NON ODD ADDRESS ERROR.
ERROR1 : ODD ADDRESS UTRAP OCCURRED.
ODDB13: NOP

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U 110A, 0000,003D,0180,0800,0000,122F
U 110B, 0018,0038,5D80,0A98,0000,1110
U 1110, 0000,003D,0180,0800,0000,124C
U 1111, 0000,003C,D580,0800,0084,7112
U 1112, 0003,001D,0180,0AF0,0000,12A2
U 1113, 0018,0038,0580,09F8,0000,1339
U 1339, 0010,0038,0180,0908,0200,133A
U 133A, 0000,003C,0180,0900,0000,1114
U 1114, 0010,0039,0180,0AC0,0000,1074
U 1115, 0010,0038,0180,0920,0200,1116
U 1116, 0000,003D,0180,0800,0000,1242
U 1117, 0800,003C,0180,0A18,0000,133B
U 133B, 0001,003C,0180,09F0,0000,1118
U 1118, 0000,193D,0180,0A70,0000,1008
U 1119, 0800,003C,0180,0A78,0000,133C
U 133C, 0003,003C,0180,0AF8,0000,133D
U 133D, 0001,003C,0180,0800,0010,133E
U 133E, 0000,013C,0180,0800,0000,111A
U 111A, 0000,003D,0180,0800,0000,1243
U 111B, 0000,003C,0180,0A18,0010,133F
U 133F, 0000,013C,0180,0800,0000,111C
U 111C, 0018,0000,0580,0A98,0000,1117
U 111D, 0000,003C,0180,0800,0000,111E
:2690

```

```

.PAGE "TEST CO TB MISS UTRAPS TEST 1"
*****
++
TEST CO TB MISS UTRAPS TEST 1
TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE TB MISS TRAPS.
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
0 = WRITE.V.NOCHK
1 = WRITE.V.WCHK
2 = READ.V.RCHK
3 = READ.V.NOCHK
4 = READ.V.WCHK
5 = READ.V.IBCHK
6 = LOCKREAD.V.NOCHK
7 = LOCKREAD.V.WCHK
--
*****
=0
TBMSE: NEWTST
R[3],K[.7]
=0 CALL,J/CSOFF
SC,K[.6]
=0 ALD,NOT.MASK,R[OE],ALU,CALL,J/TBWPTP
R[OE],K[.1]
VA,R[3]
LC,R[0]
=0 R[8],LC,CALL,J/TBWRB
VA,R[4]
=0 ER[OOP]
TBMSEA: D,R[3]
R[OE],D
=0 LAB,R[OE],D3-0?,CALL,J/TBTAB0
TBMSEB: D,R[OF]
R[OF],0
ALU,D,CLK.UBCC
Z?
=0 ERROR1 ; NO UTRAP
ALU,R[3],CLK.UBCC
Z?
=0 R[3],LA-K[.1],J/TBMSEA
NOP

```

CCCCCCCCCCCC

U 111E, 0000,003D,0180,0800,0000,122F
U 111F, 0018,0038,0D80,0A98,0000,1120
U 1120, 0000,003D,0180,0800,0000,124C
U 1121, 0000,003C,D580,0800,0084,7122
U 1122, 0003,001D,0180,0AF0,0000,12A2
U 1123, 0018,0038,0580,09F8,0000,1340
U 1340, 0010,0038,0180,0908,0200,1341
U 1341, 0000,003C,0180,0900,0000,1124
U 1124, 0010,0039,0180,0AC0,0000,1074
U 1125, 0010,0038,0180,0920,0200,1126
U 1126, 0000,003D,0180,0800,0000,1242
U 1127, 0800,003C,0180,0A18,0000,1342
U 1342, 0001,003C,0180,09F0,0000,1128
U 1128, 0000,193D,0180,0A70,0000,1004
U 1129, 0800,003C,0180,0A78,0000,1343
U 1343, 0003,003C,0180,0AF8,0000,1344
U 1344, 0001,003C,0180,0800,0010,1345
U 1345, 0000,013C,0180,0800,0000,112A
U 112A, 0000,003C,0180,0A18,0010,1346

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```

.PAGE 'TEST C1 TB MISS UTRAPS TEST 2'
*****
++
TEST C1 TB MISS UTRAPS TEST 2

TEST DESCRIPTION
THIS IS A TEST OF ALL THE MCT FUNCTIONS WHICH DISABLE
TB MISS UTRAPS.

ERROR DESCRIPTION
CODE WHICH IDENTIFIES THE MCT FUNCTION BEING TESTED
ERR1
0 = TEST.RCHK
1 = MEM.NOP
2 = TEST.WCHK
3 = READ.V.NEWPC
ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37

--
*****
=0
TBMSD: NEWTST
RC[3],K[.3]
CALL,J/CSOFF
SC,K[.6]
=0
ALO NOT.MASK,RC[OE],ALU,CALL,J/TBWPTP
RC[OF],K[.1]
VA,RC[1]
LC,RC[0]
=0
RC[8],LC,CALL,J/TBWRB
VA,RC[4]
=0
ER[OOP]
TBMSDA: D,RC[3]
RC[OE],D
=0
LAB,RC[OE],D3-0?,CALL,J/TBTAB1
D,RC[OF]
RC[OF],0
ALU,D,CLK.UBCC
Z?
=0
ALU,RC[3],CLK.UBCC,J/TBMSDB

:ERR1

```


U 112B.	0000,003D,0180,0800,0000,1243	:2746
U 1346.	0000,013C,0180,0800,0000,112C	:2747
U 112C.	0018,0000,0580,0A98,0000,1127	:2748
U 112D.	0018,0038,8580,0A98,0000,112E	:2749
U 112E.	0000,003D,0180,0800,0000,1242	:2750
U 112F.	0800,003C,0180,0A18,0000,1347	:2751
U 1347.	0001,003C,0180,09F0,0000,1130	:2752
U 1130.	0000,193D,0180,0A70,0000,1010	:2753
U 1131.	0800,003C,0180,0A78,0000,1348	:2754
U 1348.	0003,003C,0180,0AF8,0000,1349	:2755
U 1349.	0001,003C,0180,0800,0010,134A	:2756
U 134A.	0000,013C,0180,0800,0000,1132	:2757
U 1132.	0000,003C,0180,0A18,0010,134B	:2758
		:2759
		:2760
U 1133.	0000,003D,0180,0800,0000,1243	:2761
U 134B.	0000,013C,0180,0800,0000,1134	:2762
U 1134.	0018,0000,0580,0A98,0000,112F	:2763
U 1135.	0000,003C,0180,0800,0000,1136	:2764

```

ERROR1                                     ; UTRAPPED
TBMSDB:  Z?
=0      R[3]_LA-K[.1],J/TBMSDA
        R[3]_K[C]
=0      ERLOOP
TBMSDC:  D R[3]
        R[OE] D
=0      LAB R[OE],D3-0?,CALL,J/TBTAB2
        D R[OF]
        R[OF] 0
        ALU_D,CLK.UBCC
        Z?
=0      ALU_R[3],CLK.UBCC,J/TBMSDD

;ERR2
ERROR1                                     ; UTRAPPED
TBMSDD:  Z?
=0      R[3]_LA-K[.1],J/TBMSDC
        NOP

```

[illegible]

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U 1136, 0000,003D,0180,0800,0000,122F
U 1137, 0018,0038,1180,0A98,0000,1138
U 1138, 0000,003D,0180,0800,0000,124C
U 1139, 0000,003C,1180,0800,0084,713A
U 113A, 0003,001D,0180,0AF0,0000,12A2
U 113B, 0018,0038,0580,09F8,0000,134C
U 134C, 0010,0038,5180,0908,0284,734D
U 134D, 0810,0038,0580,0900,0084,B13C
U 113C, 0001,0035,0180,0AC0,0000,1074
U 113D, 0000,003C,0180,0800,0000,113E
U 113E, 0000,003D,0180,0800,0000,1242
U 113F, 0800,003C,0180,0A18,0000,134E
U 134E, 0001,003C,0180,09F0,0000,1140
U 1140, 0000,193D,0180,0A70,0000,1040
U 1141, 0800,003C,0180,0A78,0000,134F
U 134F, 0003,003C,0180,0AF8,0000,1350
U 1350, 0001,003C,0180,0800,0010,1351
U 1351, 0000,013C,0180,0800,0000,1142
U 1142, 0000,003D,0180,0800,0000,1243
U 1143, 0000,003C,0180,0A18,0010,1352
U 1352, 0000,013C,0180,0800,0000,1144
U 1144, 0018,0000,0580,0A98,0000,113F
U 1145, 0000,003C,0180,0800,0000,1146

```

```

.PAGE "TEST C2 ACCESS VIOLATION UTRAPS TEST 1"
*****
++
TEST C2 ACCESS VIOLATION UTRAPS TEST 1
TEST DESCRIPTION
THIS IS A TEST OF THE MCT FUNCTIONS WHICH ENABLE ACCESS VIOLATION
CHECK. AN ACCESS CODE (PTE<30:27>=0) ALLOWING NO ACCESS IS
USED
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
0 = WRITE.V.WCHK
1 = READ.V.RCHK
2 = READ.V.WCHK
3 = READ.V.IBCHK
4 = LOCKREAD.V.WCHK
--
*****
=0
TBACE: NEWTST
R[3]_K[4]
=0 CALL J/CSOFF
SC K[4]
=0 ALU NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
R[0F]_K[1]
VA R[1],SC K[1E]
D R[0],SC SC-K[1]
=0 ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWRB
NOP
=0 ERLOOP
TBACE1: D R[3]
R[0E]_D
=0 LAB R[0E],D3-0?,CALL,J/TBTAB3
D R[0F]
R[0F]_0
ALU_D.CLK.UBCC
Z?
=0 ERROR1
ALU_R[3],CLK.UBCC
Z?
=0 R[3]_LA-K[1],J/TBACE1
NOP

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U 1146, 0000,003D,0180,0800,0000,122F
U 1147, 0018,0038,D580,0A98,0000,1148
U 1148, 0000,003D,0180,0800,0000,124C
U 1149, 0000,003C,1180,0800,0084,714A
U 114A, 0003,001D,0180,0AF0,0000,12A2
U 114B, 0018,0038,0580,09F8,0000,1353
U 1353, 0010,0038,5180,0908,0284,7354
U 1354, 0810,0038,0580,0900,0084,814C
U 114C, 0001,0035,0180,0AC0,0000,1074
U 114D, 0000,003C,0180,0800,0000,114E
U 114E, 0000,003D,0180,0800,0000,1242
U 114F, 0800,003C,0180,0A18,0000,1355
U 1355, 0001,003C,0180,09F0,0000,1150
U 1150, 0000,193D,0180,0A70,0000,1050
U 1151, 0800,003C,0180,0A78,0000,1356
U 1356, 0003,003C,0180,0AF8,0000,1357
U 1357, 0001,003C,0180,0800,0010,1358

```

```

.PAGE "TEST C3 ACCESS VIOLATION UTRAPS TEST 2"
*****
++
TEST C3 ACCESS VIOLATION UTRAPS TEST 2
TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH
DISABLE ACCESS VIOLATION CHECKS. HERE AN ACCESS
CODE (PTE<30:27>=0) ALLOWING NO ACCESS IS USED.
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
ERR1
0 = TEST.RCHK
1 = MEM.NOP
2 = TEST.WCHK
3 = WRITE.V.NOCHK
4 = READ.V.NOCHK
5 = READ.V.NEWPC
6 = LOCKREAD.V.NOCHK
ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37
--
*****
=0
TBACD: NEWTST
R[3],K[.6]
CALL,J/CSOFF
SC K[.4]
=0
ALD NOT.MASK,R[OE],ALU,CALL,J/TBWPTP
R[OF],K[.1]
VA R[ET],SC K[.1E]
D R[EO],SC SC-K[.1]
=0
ALU_D.AND.MASK,R[8],ALU,CALL,J/TBWRB
NOP
=0
ERLOOP
TBACD1: D R[3]
R[OE],D
=0
LAB R[OE],D3-0?,CALL,J/TBTAB4
D R[OF]
R[OF],0
ALU_D,CLK.UBCC

```

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U 1358, 0000,013C,0180,0800,0000,1152 :2864
U 1152, 0000,003C,0180,0A18,0010,1359 :2865
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U 1153, 0000,003D,0180,0800,0000,1243 :2868
U 1359, 0000,013C,0180,0800,0000,1156 :2869
U 1156, 0018,0000,0580,0A98,0000,114F :2870
U 1157, 0018,0038,8580,0A98,0000,1158 :2871
U 1158, 0000,003D,0180,0800,0000,1242 :2872
U 1159, 0800,003C,0180,0A18,0000,135A :2873
U 135A, 0001,003C,0180,09F0,0000,115A :2874
U 115A, 0000,193D,0180,0A70,0000,1010 :2875
U 115B, 0800,003C,0180,0A78,0000,135B :2876
U 135B, 0003,003C,0180,0AF8,0000,135C :2877
U 135C, 0001,003C,0180,0800,0010,135D :2878
U 135D, 0000,013C,0180,0800,0000,115C :2879
U 115C, 0000,003C,0180,0A18,0010,135E :2880
:2881
:2882
U 115D, 0000,003D,0180,0800,0000,1243 :2883
U 135E, 0000,013C,0180,0800,0000,115E :2884
U 115E, 0018,0000,0580,0A98,0000,1159 :2885
U 115F, 0000,003C,0180,0800,0000,1160 :2886

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.PAGE      "TEST C4      ACCESS VIOLATION UTRAPS TEST 3"
*****
++
TEST  C4      ACCESS VIOLATION UTRAPS TEST 3

TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE
ACCESS VIOLATION CHECKS. AN ACCESS CODE
(PTE<30:27>=F) ALLOWING ONLY READ ACCESS
IS USED.

ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
      0 = WRITE.V.WCHK
      1 = READ.V.WCHK
      2 = LOCKREAD.V.WCHK
--
*****
=0
TBACN:  NEWTST
      R[3]_K[.2]
=0
      CALL J/CSOFF
      SC K[.4]
=0
      ALU NOT.MASK,R[OE]_ALU,CALL,J/TBWPTP
      R[OF] K[.1]
      VA R[7]
      D R[0],SC K[.1E]
      ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
      ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
      ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
=0
      ALU_D.ORNOT.MASK,R[8]_ALU,CALL,J/TBWRB
      NOP
=0
      ERLOOP
TBACN1: D R[3]
      R[OE] D
=0
      LAB R[OE],D3-0?,CALL,J/TBTABS
      D R[OF]
      R[OF] 0
      ALU_D.CLK.UBCC
      Z?
=0
      ERROR1
      ALU_R[3],CLK.UBCC
      Z?
=0
      R[3]_LA-K[.1],J/TBACN1
      NOP

```

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:2933 .PAGE "TEST C5 ACCESS VIOLATION UTRAPS TEST 4"
:2934 *****
:2935 ++
:2936 TEST C5 ACCESS VIOLATION UTRAPS TEST 4
:2937
:2938 TEST DESCRIPTION
:2939 THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE UTRAPS
:2940 ON ACCESS VIOLATIONS USING AN ACCESS CODE (PTE<30:27>=F)
:2941 WHICH ALLOWS READ ACCESSES ONLY.
:2942
:2943 ERROR DESCRIPTION
:2944 CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
:2945
:2946 ERR1
:2947 0 = TEST.RCHK
:2948 1 = MEM.NOP
:2949 2 = TEST.WCHK
:2950 3 = WRITE.V.NOCHK
:2951 4 = READ.V.RCHK
:2952 5 = READ.V.NOCHK
:2953 6 = READ.V.NEWPC
:2954 7 = LOCKREAD.V.NOCHK
:2955
:2956 ERR2
:2957 0 = SBI.HOLD
:2958 1 = SBI.HOLD+UNJAM
:2959 2 = INVALIDATE
:2960 3 = VALIDATE
:2961 4 = EXTWRITE.P
:2962 5 = WRITE.P
:2963 6 = LOCKWRITE.P
:2964 7 = READ.P
:2965 8 = READ.INT.SUM
:2966 9 = LOCKREAD.P
:2967 A = ALLOW.IB.READ
:2968 B = MCT/17
:2969 C = MCT/37
:2970
:2971 --
:2972 *****
:2973 =0
:2974 TBACM: NEWTST
:2975 R[3]_K[.7]
:2976 =0 CALL J/CSOFF
:2977 SC K[.4]
:2978 =0 ALD NOT.MASK,R[OE]_ALU,CALL,J/TBWPTP
:2979 RC[0F]_K[.1]
:2980 VA RC[1]
:2981 D RC[0],SC K[.1E]
:2982 ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
:2983 ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
:2984 ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
:2985 =0 ALU_D.ORNOT.MASK,R[8]_ALU,CALL,J/TBWRB
:2986 NOP
:2987 =0 ERLOOP
:2988 TBACM1: D R[3]
:2989 RC[OE]_D

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U 1170, 0000,003D,0180,0800,0000,122F
U 1171, 0018,0038,5D80,0A98,0000,1172
U 1172, 0000,003D,0180,0800,0000,124C
U 1173, 0000,003C,1180,0800,0084,7174
U 1174, 0003,001D,0180,0AF0,0000,12A2
U 1175, 0018,0038,0580,09F8,0000,1369
U 1369, 0010,0038,0180,0908,0200,136A
U 136A, 0810,0038,5180,0900,0084,736B
U 136B, 0801,001C,0580,0800,0084,B36C
U 136C, 0801,001C,0580,0800,0084,B36D
U 136D, 0801,001C,0580,0800,0084,B176
U 1176, 0001,001D,0180,0AC0,0000,1074
U 1177, 0000,003C,0180,0800,0000,1178
U 1178, 0000,003D,0180,0800,0000,1242
U 1179, 0800,003C,0180,0A18,0000,136E
U 136E, 0001,003C,0180,09F0,0000,117A

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U 117A.	0000.	193D.	0180.	0A70.	0000.	1060	:2988
U 117B.	0800.	003C.	0180.	0A7B.	0000.	136F	:2969
U 136F.	0003.	003C.	0180.	0AF8.	0000.	1370	:2990
U 1370.	0001.	003C.	0180.	0800.	0010.	1371	:2991
U 1371.	0000.	013C.	0180.	0800.	0000.	1180	:2992
U 1180.	0000.	003C.	0180.	0A18.	0010.	1372	:2993

```

=0      LAB_R[OE],D3-0?,CALL,J/TBTAB6
        D_R[OF]
        R[OF]_0
        ALU_D,CLK.UBCC
        Z?
=0      ALU_R[3],CLK.UBCC,J/TBACM2

```

U	1181.	0000	003D	0180	0800	0000	1243	:2996
U	1372.	0000	013C	0180	0800	0000	1182	:2997
U	1182.	0018	0000	0580	0A98	0000	1179	:2998
U	1183.	0018	0038	8580	0A98	0000	1184	:2999
U	1184.	0000	003D	0180	0800	0000	1242	:3000
U	1185.	0800	003C	0180	0A18	0000	1373	:3001
U	1373.	0001	003C	0180	09F0	0000	1186	:3002
U	1186.	0000	193D	0180	0A70	0000	1010	:3003
U	1187.	0800	003C	0180	0A78	0000	1374	:3004
U	1374.	0003	003C	0180	0AF8	0000	1375	:3005
U	1375.	0001	003C	0180	0800	0010	1376	:3006
U	1376.	0000	013C	0180	0800	0000	1188	:3007
U	1188.	0000	003C	0180	0A18	0010	1377	:3008

```

;ERR1
TBACM2: 2?
=0 R[3],LA-K[.1],J/TBACM1
R[3],K[C]
=0 ERLOOP
TBACM3: D R[3]
R[OE],D
=0 LAB R[OE],D3-0?,CALL,J/TBTAB2
D R[OF]
R[OF],0
ALU_D,CLK.UBCC
2?
=0 ALU R[3],CLK.UBCC,J/TBACM4

```

U 1189.	0000,003D,0180,0800,0000,1243	:3010
U 1377.	0000,013C,0180,0800,0000,118A	:3011
U 118A.	0018,0000,0580,0A98,0000,1185	:3012
U 118B.	0000,003C,0180,0800,0000,118C	:3013
		:3014

```

      TBACM4:  ERROR1
      =0      Z?      :  UTRAPPED
              R[3]_LA-K[.1],J/TBACM3
              NOP

```

[illegible]

```

3015 .PAGE      "TEST C6      M BIT UTRAPS TEST 1"
3016 *****
3017 **
3018 TEST  C6      M BIT UTRAPS TEST 1
3019
3020 TEST DESCRIPTION
3021     THIS IS A TEST OF THE MCT FUNCTIONS WHICH ENABLE MODIFY BIT
3022     UTRAPS.
3023
3024 ERROR DESCRIPTION
3025     CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
3026         0 = WRITE.V.WCHK
3027         1 = READ.V.WCHK
3028         2 = LOCKREAD.V.WCHK
3029
3030 --
3031 *****
3032 =0
3033 TBMBE:  NEWST
3034         R[3]_K[.2]
3035 =0      CALL J/CSOFF
3036         SC K[.3]
3037 =0      ALU_NOT.MASK,R[OE]_ALU,CALL,J/TBWPTP
3038         R[OF]_K[.1]
3039         VA_R[CT]
3040         SC_K[.1A]
3041         D_R[CO]
3042 =0      ALU_D.AND.MASK,R[B]_ALU,CALL,J/TBWRB
3043         NOP
3044 =0      ERLOOP
3045 TBMBE1: D_R[3]
3046         R[OE]_D
3047 =0      LAB_R[OE],D3-0?,CALL,J/TBTAB7
3048 TBMBE2: D_R[OF]
3049         R[OF]_0
3050         ALU_D,CLK.UBCC
3051         Z?
3052 =0      ERROR1                      : DIDN'T UTRAP
3053         ALU_R[3],CLK.UBCC
3054         Z?
3055 =0      R[3]_LA-K[.1],J/TBMBE1
3056         NOP

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U 119C, 0000,003D,0180,0800,0000,122F
U 119D, 0018,0038,5D80,0A98,0000,119E
U 119E, 0000,003D,0180,0800,0000,124C
U 119F, 0000,003C,0D80,0800,0084,71A0
U 11A0, 0003,001D,0180,0AF0,0000,12A2
U 11A1, 0018,0038,0580,09F8,0000,1380
U 1380, 0010,0038,0180,0908,0200,1381
U 1381, 0000,003C,E580,0800,0084,7382
U 1382, 0810,0038,0180,0900,0000,11A2
U 11A2, 0001,0035,0180,0AC0,0000,12A2
U 11A3, 0000,003C,0180,0800,0000,11A4
U 11A4, 0000,003D,0180,0800,0000,1242
U 11A5, 0800,003C,0180,0A18,0000,1383
U 1383, 0001,003C,0180,09F0,0000,11A6
U 11A6, 0000,193D,0180,0A70,0000,1068
U 11A7, 0800,003C,0180,0A40,0000,1384
U 1384, 0003,003C,0180,0AF8,0000,1385

```

```

.PAGE "TEST C7 M BIT UTRAPS TEST 2"
*****
++
TEST C7 M BIT UTRAPS TEST 2
TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH INHIBIT TB MODIFY
BIT UTRAPS.
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
ERR1
0 = TEST.RCHK
1 = MEM.NOP
2 = TEST.WCHK
3 = WRITE.V.NOCHK
4 = READ.V.RCHK
5 = READ.V.NOCHK
6 = READ.V.NEWPC
7 = LOCKREAD.V.NOCHK
ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37
--
*****
=0
TBMBD: NEWTST
R[3]_K[7]
=0 CALL J/COFF
SC_K[3]
=0 ALD NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
R[0F]_K[1]
VA_RC[T]
SC_K[1A]
D_R[0]
=0 A[U_D.AND.MASK,R[8]_ALU,CALL,J/TBWPTP
NOP
=0 ERLOOP
TBMBD1: D_R[3]
R[0E]_D
=0 LAB R[0E],D3-0?,CALL,J/TBTAB8
D_R[08]
R[0F]_0

```

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U 1385, 0001,003C,0180,0800,0010,1386 :3112
U 1386, 0000,013C,0180,0800,0000,11A8 :3113
U 11A8, 0000,003C,0180,0A18,0010,1387 :3114
                                     :3115
                                     :3116
U 11A9, 0000,003D,0180,0800,0000,1243 :3117
U 1387, 0000,013C,0180,0800,0000,11AA :3118
U 11AA, 0018,0000,0580,0A98,0000,11A5 :3119
U 11AB, 0018,0038,8580,0A98,0000,11AC :3120
U 11AC, 0000,003D,0180,0800,0000,1242 :3121
U 11AD, 0800,003C,0180,0A18,0000,1388 :3122
U 1388, 0001,003C,0180,09F0,0000,11AE :3123
U 11AE, 0000,193D,0180,0A70,0000,1010 :3124
U 11AF, 0800,003C,0180,0A78,0000,1389 :3125
U 1389, 0003,003C,0180,0AF8,0000,138A :3126
U 138A, 0001,003C,0180,0800,0010,138B :3127
U 138B, 0000,013C,0180,0800,0000,11B0 :3128
U 11B0, 0000,003C,0180,0A18,0010,138C :3129
                                     :3130
                                     :3131
U 11B1, 0000,003D,0180,0800,0000,1243 :3132
U 138C, 0000,013C,0180,0800,0000,11B2 :3133
U 11B2, 0018,0000,0580,0A98,0000,11AD :3134
U 11B3, 0000,003C,0180,0800,0000,11B4 :3135

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```

ALU_D,CLK.UBCC
Z?
=0 ALU_R[3],CLK.UBCC,J/TBMBD2
;ERR1
ERROR1 ; UTRAPPED
TBMBD2: Z?
=0 R[3]_LA-K[.1],J/TBMBD1
R[3]_K[.C]
=0 ERLOOP
TBMBD3: D_R[3]
R[OE] D
=0 LAB_R[OE],D3-0?,CALL,J/TBTAB2
D_R[OF]
R[OF] 0
ALU_D,CLK.UBCC
Z?
=0 ALU_R[3],CLK.UBCC,J/TBMBD4
;ERR2
ERROR1 ; UTRAPPED
TBMBD4: Z?
=0 R[3]_LA-K[.1],J/TBMBD3
NOP

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U 11B4, 0000,003D,0180,0800,0000,122F
U 11B5, 0018,0038,0D80,0A98,0000,11B6
U 11B6, 0000,003D,0180,0800,0000,124C
U 11B7, 0F18,0038,0980,0AF0,0000,138D
U 138D, 0000,003C,4980,3C00,0000,138E
U 138E, 0018,0038,0580,0800,0200,11B8
U 11B8, 0000,003D,0180,0800,0000,1242
U 11B9, 0800,003C,0180,0A18,0000,138F
U 138F, 0001,003C,0180,09F0,0000,11BA
U 11BA, 0000,193D,0180,0A70,0000,1048
U 11BB, 0800,003C,0180,0A78,0000,1390
U 1390, 0003,003C,0180,0AF8,0000,1391
U 1391, 0001,003C,0180,0800,0010,1392
U 1392, 0000,013C,0180,0800,0000,11BC
U 11BC, 0000,003D,0180,0800,0000,1243
U 11BD, 0000,003C,0180,0A18,0010,1393
U 1393, 0000,013C,0180,0800,0000,11BE
U 11BE, 0018,0000,0580,0A98,0000,11BF
U 11BF, 0000,003C,0180,0800,0000,11C0
:3172

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.PAGE "TEST C8 ALIGNMENT UTRAPS TEST 1"
*****
++
TEST C8 ALIGNMENT UTRAPS TEST 1
TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE ALIGNMENT UTRAPS.
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
0 = WRITE.V.WCHK
1 = READ.V.RCHK
2 = READ.V.WCHK
3 = READ.V.IBCHK
--
*****
=0
TBAL: NEWTST
R[3]_K[.3]
=0 CALL J/COFF
R[OE]_K[.2],D_0
ID[TBERO]_D
VA_K[.1]
=0 ER[OOP]
TBAL1: D_R[3]
R[OE]_D
=0 LAB_R[OE],D3-0?,CALL,J/TBTAB9
D_R[OF]
R[OF]_0
ALU_D,CLK.UBCC
Z?
=0 ERROR1 ; NO UTRAP OCCURRED.
ALU_R[3],CLK.UBCC
Z?
=0 R[3]_LA-K[.1]
NOP

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U 11C0, 0000,003D,0180,0800,0000,122F
U 11C1, 0018,0038,D980,0A98,0000,11C2
U 11C2, 0000,003D,0180,0800,0000,124C
U 11C3, 0F18,0038,0980,0AF0,0000,1394
U 1394, 0000,003C,4980,3C00,0000,1395
U 1395, 0018,0038,0580,0800,0200,11C4
U 11C4, 0000,003D,0180,0800,0000,1242
U 11C5, 0800,003C,0180,0A18,0000,1396
U 1396, 0001,003C,0180,09F0,0000,11C6
U 11C6, 0000,193D,0180,0A70,0000,1020
U 11C7, 0800,003C,0180,0A78,0000,1397
U 1397, 0003,003C,0180,0AF8,0000,1398
U 1398, 0001,003C,0180,0800,0010,1399
U 1399, 0000,013C,0180,0800,0000,11C8
U 11C8, 0000,003C,0180,0A18,0010,139A

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```

.PAGE "TEST C9 ALIGNMENT UTRAPS TEST 2"
*****
++
TEST C9 ALIGNMENT UTRAPS TEST 2
TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE ALIGNMENT
ERROR UTRAPS.
ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
ERR1
0 = TEST.RCHK
1 = MEM.NOP
2 = TEST.WCHK
3 = WRITE.V.WCHK
4 = WRITE.V.WCHK
5 = READ.V.RCHK
6 = READ.V.RCHK
7 = READ.V.WCHK
8 = READ.V.WCHK
9 = READ.V.NEWPC
ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37
--
*****
=0
TBALD: NEWTST
R[3],K[.9]
=0
CALL J/CSOFF
R[OE],K[.2],D_0
ID[TBERO]_D
VA,K[.1]
=0
ER[OOP]
TBALD1: D,R[3]
R[OE],D
=0
LAB R[OE],D3-0?,CALL,J/TBTABA
D,R[OF]
R[OF],0
ALU_D,CLK.UBCC
Z?
=0
ALU_R[3],CLK.UBCC,J/TBALD2

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:3228
:3229 ;ERR1
:3230 ERROR1 ; UTRAPPED
:3231 TBALD2: Z?
:3232 =0 R[3]_LA-K[.1],J/TBALD1
:3233 R[3]_K[.C]
:3234 =0 ERLOOP
:3235 TBALD3: D R[3]
:3236 R[OE] D
:3237 =0 LAB R[OE],D3-0?,CALL,J/TBTAB2
:3238 D R[OF]
:3239 R[OF]_0
:3240 ALU_D,CLK.UBCC
:3241 Z?
:3242 =0 ALU_R[3],CLK.UBCC,J/TBALD4
:3243
:3244 ;ERR2
:3245 ERROR1 ; UTRAPPED
:3246 TBALD4: Z?
:3247 =0 R[3]_LA-K[.1],J/TBALD3
:3248 NOP

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U 11C9, 0000,003D,0180,0800,0000,1243
U 139A, 0000,013C,0180,0800,0000,11CA
U 11CA, 0018,0000,0580,0A98,0000,11C5
U 11CB, 0018,0038,8580,0A98,0000,11CC
U 11CC, 0000,003D,0180,0800,0000,1242
U 11CD, 0800,003C,0180,0A18,0000,139B
U 139B, 0001,003C,0180,09F0,0000,11CE
U 11CE, 0000,193D,0180,0A70,0000,1010
U 11CF, 0800,003C,0180,0A78,0000,139C
U 139C, 0003,003C,0180,0AF8,0000,139D
U 139D, 0001,003C,0180,0800,0010,139E
U 139E, 0000,013C,0180,0800,0000,11D0
U 11D0, 0000,003C,0180,0A18,0010,139F

U 11D1, 0000,003D,0180,0800,0000,1243
U 139F, 0000,013C,0180,0800,0000,11D2
U 11D2, 0018,0000,0580,0A98,0000,11CD
U 11D3, 0000,003C,0180,0800,0000,11D4

Address	Hex Data	Assembly	Comments
U 11D4	0000,003D,0180,0800,0000,122F	TBXPE: NEWTST	
U 11D5	0018,0038,0D80,0A98,0000,11D6	R[3],K[.3]	
U 11D6	0000,003D,0180,0800,0000,124C	=0 CALL,J/CSOFF	
U 11D7	0000,003C,0180,0800,0000,11D8	NOP	
U 11D8	0000,003D,0180,0800,0000,12A2	=0 CALL,J/TBWPTP	
U 11D9	0018,0038,1980,0800,0200,13A0	VA_K[ZERO]	
U 13A0	0000,003C,0180,0900,0000,11DA	LC-R[0]	
U 11DA	0010,0039,0180,0AC0,0000,1074	=0 R[8],LC,CALL,J/TBWRB	
U 11DB	0018,0038,0580,09F8,0000,13A1	R[0F],K[.1]	
U 13A1	0818,0038,8180,0800,0000,13A2	D_K[.3FF]	
U 13A2	0600,003C,0180,0800,0000,13A3	D-D.RIGHT,SI/ZERO	
U 13A3	0001,003C,0180,0800,0200,11DC	VA D	
U 11DC	0018,0039,1180,0AF0,0000,1242	=0 R[0E],K[.4],ERLOOP	
U 11DD	0800,003C,0180,0A18,0000,13A4	TBXPE1: D R[3]	
U 13A4	0001,003C,0180,09F0,0000,11DE	R[0E] D	
U 11DE	0000,193D,0180,0A70,0000,1048	=0 LAB R[0E],D3-0?,CALL,J/TBTAB9	
U 11DF	0800,003C,0180,0A78,0000,13A5	D R[0F]	
U 13A5	0003,003C,0180,0AF8,0000,13A6	R[0F] 0	
U 13A6	0001,003C,0180,0800,0010,13A7	ALU_D,CLK.UBCC	
U 13A7	0000,013C,0180,0800,0000,11E0	Z?	
U 11E0	0000,003D,0180,0800,0000,1243	=0 ERROR1	; NO UTRAP OCCURRED.
U 11E1	0000,003C,0180,0A18,0010,13A8	ALU_R[3],CLK.UBCC	
U 13A8	0000,013C,0180,0800,0000,11E2	Z?	
U 11E2	0018,0000,0580,0A98,0000,11DD	=0 R[3],LA-K[.1],J/TBXPE1	
U 11E3	0000,003C,0180,0800,0000,11E4	NOP	

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U 11E4, 0000,003D,0180,0800,0000,122F
U 11E5, 0018,0038,D980,0A98,0000,11E6
U 11E6, 0000,003D,0180,0800,0000,124C
U 11E7, 0000,003C,0180,0800,0000,11E8
U 11E8, 0000,003D,0180,0800,0000,12A2
U 11E9, 0018,0038,1980,0800,0200,13A9
U 13A9, 0000,003C,0180,0900,0000,11EA
U 11EA, 0010,0039,0180,0AC0,0000,1074
U 11EB, 0018,0038,0580,09F8,0000,13AA
U 13AA, 0818,0038,8180,0800,0000,13AB
U 13AB, 0600,003C,0180,0800,0000,13AC
U 13AC, 0001,003C,0180,0800,0200,11EC
U 11EC, 0018,0039,1180,0AF0,0000,1242
U 11ED, 0800,003C,0180,0A18,0000,13AD
U 13AD, 0001,003C,0180,09F0,0000,11EE

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.PAGE "TEST CB CROSS PAGE UTRAPS TEST 2"
*****
**
TEST CB CROSS PAGE UTRAPS TEST 2

TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE CROSS PAGE
UTRAPs.

ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED

ERR1
0 = TEST.RCHK
1 = MEM.NOP
2 = TEST.WCHK
3 = WRITE.V.WCHK
4 = WRITE.V.WCHK
5 = READ.V.RCHK
6 = READ.V.RCHK
7 = READ.V.WCHK
8 = READ.V.WCHK
9 = READ.V.NEWPC

ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37

--
*****
=0
TBXPD: NEWTST
R[3],K[.9]
=0
CALL,J/CsOFF
NOP
=0
CALL,J/TBWPTP
VA,K[ZERO]
LC,R[0]
=0
R[8],LC,CALL,J/TBWRB
R[0F],K[.1]
D,K[.3FF]
D-D.RIGHT,S1/ZERO
VA,D
=0
R[0E],K[.4],ERLOOP
TBXPD1: D,R[3]
R[0E],D

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U 11EE, 0000,193D,0180,0A70,0000,1020 :3347 =0 LAB_R[OE],D3-0?,CALL,J/TBTABA
U 11EF, 0800,003C,0180,0A78,0000,13AE :3348 D_R[OF]
U 13AE, 0003,003C,0180,0AF8,0000,13AF :3349 R[OF]_0
U 13AF, 0001,003C,0180,0800,0010,13B0 :3350 ALU_D,CLK.UBCC
U 13B0, 0000,013C,0180,0800,0000,11F0 :3351 Z?
U 11F0, 0000,003C,0180,0A18,0010,13B1 :3352 =0 ALU_R[3],CLK.UBCC,J/TBXP2
U 11F1, 0000,003D,0180,0800,0000,1243 :3353 ERROR1 ; A UTRAP OCCURRED.
U 13B1, 0000,013C,0180,0800,0000,11F2 :3354 TBXP2: Z?
U 11F2, 0018,0000,0580,0A98,0000,11ED :3355 =0 R[3]_LA-K[.1],J/TBXP1
U 11F3, 0018,0038,8580,0A98,0000,11F4 :3356 R[3]_K[.C]
U 11F4, 0000,003D,0180,0800,0000,1242 :3357 =0 ERLOOP
U 11F5, 0800,003C,0180,0A18,0000,13B2 :3358 TBXP3: D_R[3]
U 13B2, 0001,003C,0180,09F0,0000,11F6 :3359 R[OE]_D
U 11F6, 0000,193D,0180,0A70,0000,1010 :3360 =0 LAB_R[OE],D3-0?,CALL,J/TBTAB2
U 11F7, 0800,003C,0180,0A78,0000,13B3 :3361 D_R[OF]
U 13B3, 0003,003C,0180,0AF8,0000,13B4 :3362 R[OF]_0
U 13B4, 0001,003C,0180,0800,0010,13B5 :3363 ALU_D,CLK.UBCC
U 13B5, 0000,013C,0180,0800,0000,11F8 :3364 Z?
U 11F8, 0000,003C,0180,0A18,0010,13B6 :3365 =0 ALU_R[3],CLK.UBCC,J/TBXP4
:3366
:3367 ;ERR2
U 11F9, 0000,003D,0180,0800,0000,1243 :3368 ERROR1 ; A UTRAP OCCURRED.
U 13B6, 0000,013C,0180,0800,0000,11FA :3369 TBXP4: Z?
U 11FA, 0018,0000,0580,0A98,0000,11F5 :3370 =0 R[3]_LA-K[.1],J/TBXP3
U 11FB, 0000,003C,0180,0800,0000,1200 :3371 NOP

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U 1200, 0000,003D,0180,0800,0000,122F
U 1201, 0018,0038,F580,0A98,0000,1202
U 1202, 0000,003D,0180,0800,0000,124C
U 1203, 0018,0038,4180,0AF0,0000,1204
U 1204, 0000,003D,0180,0800,0000,12A2
U 1205, 0010,0038,0180,0908,0200,13B7
U 13B7, 0000,003C,0180,0900,0000,1206
U 1206, 0010,0039,0180,0AC0,0000,1074
U 1207, 0010,0038,0180,0920,0200,13B8
U 13B8, 0000,003C,0180,0918,0000,1208
U 1208, 0010,0039,0180,0AC0,0000,1072
U 1209, 0018,0038,0580,09F8,0000,13B9
U 13B9, 0818,0038,5D80,0800,0000,120A
U 120A, 0000,003D,4980,3C00,0000,1242
U 120B, 0800,003C,0180,0A18,0000,13BA
U 13BA, 0001,003C,0180,09F0,0000,120C
U 120C, 0000,193D,0180,0A70,0000,1030
U 120D, 0800,003C,0180,0A78,0000,13BB
U 13BB, 0003,003C,0180,0AF8,0000,13BC
U 13BC, 0001,003C,0180,0800,0010,13BD
U 13BD, 0000,013C,0180,0800,0000,120E
U 120E, 0000,003D,0180,0800,0000,1243
U 120F, 0000,003C,0180,0A18,0010,13BE
U 13BE, 0000,013C,0180,0800,0000,1210
U 1210, 0018,0000,0580,0A98,0000,120B
U 1211, 0F00,003C,0180,0800,0000,13BF
U 13BF, 0000,003C,4980,3C00,0000,1212

```

```

.PAGE "TEST CC TB PARITY UTRAPS TEST 1"
*****
++
TEST CC TB PARITY UTRAPS TEST 1

TEST DESCRIPTION
THIS IS ATEST OF MCT FUNCTIONS WHICH ENABLE TB PARITY ERROR
UTRAP.

ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
0 = TEST.RCHK
1 = TEST.WCHK
2 = WRITE.V.NOCHK
3 = WRITE.V.WCHK
4 = LOCKWRITE.V.XCHK
5 = READ.V.RCHK
6 = READ.V.NOCHK
7 = READ.V.WCHK
8 = READ.V.IBCHK
9 = LOCKREAD.V.NOCHK
A = LOCKREAD.V.WCHK
--
*****
=0
TBPRE: NEWTST
R[3],K[A]
=0 CALL,J/CSOFF
R[OE],K[.80]
=0 CALL,J/TBWPTP
VA_R[1]
LC_R[0]
=0 R[8],LC,CALL,J/TBWRB
VA_R[4]
LC_R[3]
=0 R[8],LC,CALL,J/TBWRO
R[OF],K[.1]
D,K[.7]
=0 ID[TBERO],D,ERLOOP
TBPRE1: D,R[3]
R[OE],D
=0 LAB,R[OE],D3-0?,CALL,J/TBTABB
D,R[OF]
R[OF],0
ALU,D,CLK.UBCC
Z?
=0 ERROR1 ; NO UTRAP OCCURRED
ALU,R[3],CLK.UBCC
Z?
=0 R[3],LA-K[.1],J/TBPRE1
D,0
ID[TBERO],D

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:3479
U 1212, 0000,003D,0180,0800,0000,122F
U 1213, 0018,0038,0580,0A98,0000,1214
U 1214, 0000,003D,0180,0800,0000,124C
U 1215, 0018,0038,4180,0AF0,0000,1216
U 1216, 0000,003D,0180,0800,0000,12A2
U 1217, 0010,0038,0180,0908,0200,13C0
U 13C0, 0000,003C,0180,0900,0000,1218
U 1218, 0010,0039,0180,0AC0,0000,1074
U 1219, 0010,0038,0180,0920,0200,13C1
U 13C1, 0000,003C,0180,0918,0000,121A
U 121A, 0010,0039,0180,0AC0,0000,1072
U 121B, 001B,0038,0580,09F8,0000,13C2
U 13C2, 0818,0038,5D80,0800,0000,121C
U 121C, 0000,003D,4980,3C00,0000,1242
U 121D, 0800,003C,0180,0A18,0000,13C3
U 13C3, 0001,003C,0180,09F0,0000,121E
U 121E, 0000,193D,0180,0A70,0000,10B2
U 121F, 0800,003C,0180,0A78,0000,13C4
U 13C4, 0003,003C,0180,0AF8,0000,13C5
U 13C5, 0001,003C,0180,0800,0010,13C6
U 13C6, 0000,013C,0180,0800,0000,1220
U 1220, 0000,003C,0180,0A18,0010,13C7

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.PAGE "TEST CD TB PARITY UTRAPS TEST 2"
*****
++
TEST CD TB PARITY UTRAPS TEST 2

TEST DESCRIPTION
THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE
TB PARITY ERROR UTRAPS.

ERROR DESCRIPTION
CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
ERR1
0 = MEM.NOP
1 = READ.V.NEWPC
ERR2
0 = SBI.HOLD
1 = SBI.HOLD+UNJAM
2 = INVALIDATE
3 = VALIDATE
4 = EXTWRITE.P
5 = WRITE.P
6 = LOCKWRITE.P
7 = READ.P
8 = READ.INT.SUM
9 = LOCKREAD.P
A = ALLOW.IB.READ
B = MCT/17
C = MCT/37
--
*****
=0
TBPRD: NEWTST
R[3],K[.1]
CALL,J/COFF
R[OE],K[.80]
CALL,J/TBWPTP
VA_R[1]
LC_R[0]
R[8],LC,CALL,J/TBWRB
VA_R[4]
LC_R[3]
R[8],LC,CALL,J/TBWRO
R[OE],K[.1]
D,K[.7]
ID[TBERO],D,ERLOOP
=0
TBPRD1: D,R[3]
R[OE],D
LAB,R[OE],D3-0?,CALL,J/TBTABC
D,R[OE]
R[OE],0
ALU,D,CLK,UBCC
Z?
=0
ALU,R[3],CLK,UBCC,J/TBPRD2

```

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:3480
U 1221, 0000,003D,0180,0800,0000,1243 :3481
U 13C7, 0000,013C,0180,0800,0000,1222 :3482
U 1222, 0018,0000,0580,0A98,0000,121D :3483
U 1223, 0018,0038,8580,0A98,0000,1224 :3484
U 1224, 0000,003D,0180,0800,0000,1242 :3485
U 1225, 0800,003C,0180,0A18,0000,13C8 :3486
U 13C8, 0001,003C,0180,09F0,0000,1226 :3487
U 1226, 0000,193D,0180,0A70,0000,1010 :3488
U 1227, 0800,003C,0180,0A78,0000,13C9 :3489
U 13C9, 0003,003C,0180,0AF8,0000,13CA :3490
U 13CA, 0001,003C,0180,0800,0010,13CB :3491
U 13CB, 0000,013C,0180,0800,0000,1228 :3492
U 1228, 0000,003C,0180,0A18,0010,13CC :3493
:3494
:3495
U 1229, 0000,003D,0180,0800,0000,1243 :3496
U 13CC, 0000,013C,0180,0800,0000,122A :3497
U 122A, 0018,0000,0580,0A98,0000,1225 :3498
U 122B, 0000,003C,0180,0800,0000,122C :3499
:3500
U 122C, 0000,003D,0180,0800,0000,122F :3501

;ERR1
ERROR1 ; A UTRAP OCCURRED.
TBPRD2: Z?
=0 R[3]_LA-K[.1],J/TBPRD1
R[3]_K[.C]
=0 ERLOOP
TBPRD3: D R[3]
R[OE] D
=0 LAB R[OE],D3-0?,CALL,J/TBTAB2
D R[OF]
R[OF]_0
ALU_D,CLK.UBCC
Z?
=0 ALU_R[3],CLK.UBCC,J/TBPRD4

;ERR2
ERROR1 ; A UTRAP OCCURRED
TBPRD4: Z?
=0 R[3]_LA-K[.1],J/TBPRD3
NOP
=0
DUMMY1: NEWST

```

3

Location / Line Number Index

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	2241=	2242=	2243=	2244=
U 1008	2230=	2231=	2232=	2233=	2234=	2235=	2236=	2237=
U 1010	2250=	2251=	2252=	2253=	2254=	2255=	2256=	2257=
U 1018	2258=	2259=	2260=	2261=	2262=	1839	1862=	1863=
U 1020	2332=	2333=	2334=	2335=	2336=	2337=	2338=	2339=
U 1028	2340=	2341=	1951=	1952=	2288=	2289=	2290=	1840
U 1030	2346=	2347=	2348=	2349=	2350=	2351=	2352=	2353
U 1038	2354=	2355=	2356=	1841	2307=	2308=	2309=	1842
U 1040	2267=	2268=	2269=	2270=	2271=	1843	1970=	1971=
U 1048	2325=	2326=	2327=	2328=	1972=	1973=	1902:	1844
U 1050	2276=	2277=	2278=	2279=	2280=	2281=	2282=	1864
U 1058	1982=	1983=	1905:	1865	1984=	1985=	1908:	1866
U 1060	2295=	2296=	2297=	2298=	2299=	2300=	2301=	2302=
U 1068	2314=	2315=	2316=	2317=	2318=	2319=	2320=	2321=
U 1070	1986=	1987=	1992=	1993=	1996=	1997=	2006=	2007=
U 1078	2008=	2009=	2025=	2026=	2027=	2028=	2037=	2038=
U 1080	2053=	2054=	2058=	2059=	2075=	2076=	2078=	2079=
U 1088	2083=	2084=	2111=	2112=	2114=	2115=	2117=	2118=
U 1090	2121=	2122=	2124=	2125=	2127=	2128=	2131=	2132=
U 1098	2135=	2136=	2175=	2176=	2180=	2181=	2183=	2184=
U 10A0	2185=	2186=	2190=	2191=	2193=	2194=	2195=	2196=
U 10A8	2200=	2201=	2203=	2204=	2205=	2206=	2210=	2211=
U 10B0	2213=	2214=	2361=	2362=	2381=	2382=	2383=	2384=
U 10B8	2387=	2388=	2396=	2397=	2398=	2399=	2412=	2413=
U 10C0	2416=	2417=	2423=	2424=	2425=	2426=	2439=	2440=
U 10C8	2443=	2444=	2468=	2469=	2470=	2471=	2474=	2475=
U 10D0	2483=	2484=	2485=	2486=	2498=	2499=	2502=	2503=
U 10D8	2510=	2511=	2512=	2513=	2526=	2527=	2530=	2531=
U 10E0	2538=	2539=	2540=	2541=	2554=	2555=	2558=	2559=
U 10E8	2566=	2567=	2568=	2569=	2582=	2583=	2586=	2587=
U 10F0	2594=	2595=	2596=	2597=	2611=	2612=	2615=	2616=
U 10F8	2623=	2624=	2625=	2626=	2639=	2640=	2643=	2644=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1867	2668=	2669=	1834:	1835:	1836:	1837:
U 1110	2670=	2671=	2672=	2673=	2676=	2677=	2678=	2679=
U 1118	2681=	2682=	2686=	2687=	2689=	2690=	2725=	2726=
U 1120	2727=	2728=	2729=	2730=	2733=	2734=	2735=	2736=
U 1128	2738=	2739=	2743=	2746=	2748=	2749=	2750=	2751=
U 1130	2753=	2754=	2758=	2761=	2763=	2764=	2786=	2787=
U 1138	2788=	2789=	2790=	2791=	2794=	2795=	2796=	2797=
U 1140	2799=	2800=	2804=	2805=	2807=	2808=	2847=	2848=
U 1148	2849=	2850=	2851=	2852=				

[illegible]

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3099=	3100=	3104=	3105=	3106=	3107=	3109=	3110=
U 11A8	3114=	3117=	3119=	3120=	3121=	3122=	3124=	3125=
U 11B0	3129=	3132=	3134=	3135=	3154=	3155=	3156=	3157=
U 11B8	3160=	3161=	3163=	3164=	3168=	3169=	3171=	3172=
U 11C0	3213=	3214=	3215=	3216=	3219=	3220=	3222=	3223=
U 11C8	3227=	3230=	3232=	3233=	3234=	3235=	3237=	3238=
U 11D0	3242=	3245=	3247=	3248=	3267=	3268=	3269=	3270=
U 11D8	3271=	3272=	3274=	3275=	3279=	3280=	3282=	3283=
U 11E0	3287=	3288=	3290=	3291=	3332=	3333=	3334=	3335=
U 11E8	3336=	3337=	3339=	3340=	3344=	3345=	3347=	3348=
U 11F0	3352=	3353=	3355=	3356=	3357=	3358=	3360=	3361=
U 11F8	3365=	3368=	3370=	3371=	2223:	2224:	2225:	2226:
U 1200	3398=	3399=	3400=	3401=	3402=	3403=	3405=	3406=
U 1208	3408=	3409=	3411=	3412=	3414=	3415=	3419=	3420=
U 1210	3422=	3423=	3457=	3458=	3459=	3460=	3461=	3462=
U 1218	3464=	3465=	3467=	3468=	3470=	3471=	3473=	3474=
U 1220	3478=	3481=	3483=	3484=	3485=	3486=	3488=	3489=
U 1228	3493=	3496=	3498=	3499=	3501=	1869	1870	1880
U 1230	1881	1882	1883	1884	1885	1886	1887	1888
U 1238	1889	1890	1891	1892	1893	1894	1895	1896
U 1240	1897	1898	1899	1900	1901	1903	1904	1936
U 1248	1937	1943	1944	1945	1950	1953	1954	1957
U 1250	1958	1959	1960	1963	1964	1965	1988	1989
U 1258	1999	2010	2011	2012	2018	2019	2020	2021
U 1260	2022	2023	2024	2029	2030	2031	2032	2033
U 1268	2034	2035	2036	2039	2040	2045	2046	2047
U 1270	2048	2049	2050	2051	2052	2055	2056	2057
U 1278	2066	2067	2068	2069	2070	2071	2072	2073
U 1280	2074	2077	2080	2081	2082	2086	2088	2089
U 1288	2090	2091	2092	2093	2094	2095	2096	2097
U 1290	2098	2099	2100	2101	2102	2103	2104	2105
U 1298	2106	2107	2108	2109	2113	2119	2123	2129
U 12A0	2133	2137	2163	2164	2165	2166	2167	2168
U 12A8	2169	2170	1929:	2171	2172	2173	2174	2177
U 12B0	2178	2179	2182	2187	2188	2189	2192	2197
U 12B8	2198	2199	2202	2207	2208	2209	2212	2218
U 12C0	2385	2386	2389	2390	2400	2401	2402	2403
U 12C8	2404	2405	2406	2407	2408	2409	2410	2411
U 12D0	2414	2415	2427	2428	2429	2430	2431	2432
U 12D8	2433	2434	2435	2436	2437	2438	2441	2442
U 12E0	2472	2473	2476	2477	2487	2488	2489	2490
U 12E8	2491	2492	2493	2494	2495	2496	2497	2500
U 12F0	2501	2514	2515	2516	2517	2518	2519	2520
U 12F8	2521	2522	2523	2524	2525	2528	2529	2542
U 1300	2543	2544	2545	2546	2547	2548	2549	2550
U 1308	2551	2552	2553	2556	2557	2570	2571	2572
U 1310	2573	2574	2575	2576	2577	2578	2579	2580
U 1318	2581	2584	2585	2598	2599	2600	2601	2602
U 1320	2603	2604	2605	2606	2607	2608	2609	2610
U 1328	2613	2614	2627	2628	2629	2630	2631	2632
U 1330	2633	2634	2635	2636	2637	2638	2641	2642
U 1338	2645	2674	2675	2680	2683	2684	2685	2688
U 1340	2731	2732	2737	2740	2741	2742	2747	2752

ZZ-ESKAH-V132
ESKAH2C.MCR

Line Number Index

MICRO2

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B 13

SEQ 0565
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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2755	2756	2757	2762	2792	2793	2798	2801
U 1350	2802	2803	2806	2853	2854	2859	2862	2863
U 1358	2864	2869	2874	2877	2878	2879	2884	2913
U 1360	2914	2915	2916	2917	2922	2925	2926	2927
U 1368	2930	2978	2979	2980	2981	2982	2987	2990
U 1370	2991	2992	2997	3002	3005	3006	3007	3012
U 1378	3039	3040	3041	3046	3049	3050	3051	3054
U 1380	3101	3102	3103	3108	3111	3112	3113	3118
U 1388	3123	3126	3127	3128	3133	3158	3159	3162
U 1390	3165	3166	3167	3170	3217	3218	3221	3224
U 1398	3225	3226	3231	3236	3239	3240	3241	3246
U 13A0	3273	3276	3277	3278	3281	3284	3285	3286
U 13A8	3289	3338	3341	3342	3343	3346	3349	3350
U 13B0	3351	3354	3359	3362	3363	3364	3369	3404
U 13B8	3407	3410	3413	3416	3417	3418	3421	3424
U 13C0	3463	3466	3469	3472	3475	3476	3477	3482
U 13C8	3487	3490	3491	3492	3497			
U 13D0 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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SEQ 0566
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Words not in bounds

ESKODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH2C	989

Used	989
Remaining	

```
Total microwords used in memory U: 989
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

22-ESKAH-V132 Line Number Index
ESKAH2C.MCR MICRO2 1M(01) 16-DEC-82 11:16:42

D 13

SEQ 0567
Page 9

; The files used in this assembly are:

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH2C.MIC

```
Pass 1 warnings: 0    Pass 2 warnings: 0
Pass 1 errors: 0    Pass 2 errors: 0
```

NEW 3333333333 3333333333 3333 3333 3333333333

ESKAH2D.MCR

MICRG2 1M(01)

16-DEC-82 11

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2159	TEST CE CACHE WRITE PULSE LOGIC TEST
: 2745	TEST CF ADDRESS BIT 2 IN GROUP 0 TEST
: 2844	TEST D0 ADDRESS BIT 2 IN GROUP 1 TEST
: 2943	TEST D1 DATA PATH TO GROUP 0 TEST
: 3054	TEST D2 DATA PATH TO GROUP 1 TEST
: 3165	TEST D3 ADDRESS PATH TO GROUP 0 TAG MEMORY TEST
: 3279	TEST D4 ADDRESS PATH TO GROUP 1 TAG MEMORY TEST
: 3395	TEST D5 GROUP 0 HIT/MISS COMPARATORS TEST

ZZ-ESKAH-V132 Subroutines
ESKAH2D.MCR

MICRO2 1M(01) 16-DEC-82 11:22:49

F 13

SEQ 0569
Page

:1
:1804 .NOLIST
:1805 .LIST

ZZ-ESKAH-V132 Subroutines
ESKAH2D.MCR
MICRO2 1M(01) 16-DEC-82 11:22:49
F 13
SEQ 0569
Page
:1
:1804 .NOLIST
:1805 .LIST

```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      +
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN.
:1819
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823
:1824      -
U 1100. 0000,003C,1980,0800,0084,7003 :1825 1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
U 1101. 0000,003C,0580,0800,0084,7001 :1826 1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
U 1102. 0000,003C,0980,0800,0084,7001 :1827 1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
U 1103. 0000,003C,0D80,0800,0084,7001 :1828 1103: SC_K[.3],J/TRPH0      : TB MODIFY
U 1104. 0000,003C,1180,0800,0084,7001 :1829 1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
U 1105. 0000,003C,D580,0800,0084,7001 :1830 1105: SC_K[.6],J/TRPH0      : TB MISS
U 1106. 0000,003C,D980,0800,0084,7001 :1831 1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
U 1107. 0000,003C,5D80,0800,0084,7001 :1832 1107: SC_K[.7],J/TRPH0      : TB PARITY
U 1108. 0000,003C,0180,0800,0084,7001 :1833 1108: SC_K[.8],J/TRPH0      : CACHE PARITY
U 110C. 0000,003C,8580,0800,0084,7003 :1834 110C: SC_K[.C],J/TRPH1      : RDS
U 110D. 0000,003C,8980,0800,0084,7003 :1835 110D: SC_K[.D],J/TRPH1      : TIME OUT
U 110E. 0000,003C,6580,0800,0084,7001 :1836 110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
U 110F. 0000,003C,6180,0800,0084,7003 :1837 110F: SC_K[.F],J/TRPH1     : CS PARITY
U 1001. 0000,003C,81F0,2C00,0000,102B :1838 TRPH0: Q_ID[USTACK]
U 102B. 0C00,003C,01E0,0800,0000,1037 :1839      Q_D,D Q
U 1037. 0000,003C,8180,3C00,0000,104F :1840      ID[USTACK],D
U 104F. 0C00,003C,01E0,0800,0000,105B :1841      Q_D,D Q
U 105B. 0000,003C,01C0,0A78,0000,105F :1842      Q-R[OF]
U 105F. 0001,2024,0180,0800,0010,1097 :1843      A[U_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
U 1097. 0000,013C,0180,0800,0000,1002 :1844      Z?                          : BRANCH IF NO
U 1002. 0001,2036,0180,0AF8,0000,0000 :1845 =0      ALU_Q.AND.MASK,R[OF],ALU,RETURNS : CLEAR THE BIT AND RETURN
:1846      +
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      -

```

U 1003. 0018.0038.1D80.09E8.0000.104C :1861
U 104C. 0000.003D.D980.0800.0084.724D :1862
U 104D. 0000.003C.49F0.2C00.0000.109F :1863
U 109F. 0001.203C.4DF0.2DB0.0000.10AB :1864
U 10AB. 0001.203C.65F0.2DB8.0000.10B3 :1865
U 10B3. 0001.203C.6DF0.2DD8.0000.1109 :1866
U 1109. 0001.203C.75F0.2DE0.0000.1154 :1867
U 1154. 0001.203C.79F0.2DC8.0000.1231 :1868
U 1231. 0001.203C.69F0.2DC0.0000.1232 :1869
U 1232. 0001.203C.81F0.2DD0.0000.1000 :1870
U 1000. 0001.203D.0180.09F0.0000.1247 :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
RC[0E] Q,ERROR1

1000: RC[0E] Q,ERROR1
+
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2

U 1233. 0000.003C.65F8.0800.0084.7234 :1880
U 1234. 0818.0038.8D80.0800.0000.1235 :1881
U 1235. 0D00.003C.0180.0800.0000.1236 :1882
U 1236. 0000.003C.3D80.3C00.0000.1237 :1883
U 1237. 0818.0038.0580.0800.0000.1238 :1884
U 1238. 0D00.003C.0180.0800.0000.1239 :1885
U 1239. 0F00.003C.3180.3C00.0000.123A :1886
U 123A. 0000.003C.5D80.3C00.0000.123B :1887
U 123B. 0000.003C.3980.3C00.0000.123C :1888
U 123C. 0000.003C.2980.3C00.0000.123D :1889
U 123D. 0000.003C.4980.3C00.0000.123E :1890
U 123E. 0818.0038.C180.0800.0000.123F :1891
U 123F. 0000.003C.6580.3C00.0000.1240 :1892
U 1240. 0F00.003C.6D80.3C00.0000.1241 :1893
U 1241. 0000.003C.6D80.3C00.0000.1242 :1894
U 1242. 0000.003C.6580.3C00.0000.1243 :1895
U 1243. 0003.003C.0180.09F0.0000.1244 :1896
U 1244. 0003.003C.0180.0AF8.0000.1245 :1897
U 1245. 0003.003C.0180.09E8.0000.105E :1898
U 1246. 0818.0038.0980.0800.0000.105E :1899
U 1247. 0810.0038.0180.0978.0000.1248 :1900
U 1248. 0819.0034.4D80.0800.0000.104E :1901
U 104E. 0819.0030.1180.0800.0000.105E :1902
U 1249. 0810.0038.0180.0978.0000.124A :1903
U 124A. 0819.0034.4D80.0800.0000.105A :1904
U 105A. 0819.0030.D580.0800.0000.105E :1905

SCOPE: SC_KC[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_KC[.1F] : ...
D-DAL.SC :
ID[PSL]_D : WRITE THE PSL
D_KC[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC :
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.[S]]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.[S]]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_KC[.FFFF] :
ID[SBI.ERR]_D :
ID[FAULT]_D,D_0 :
ID[FAULT]_D :
ID[SBI.ERR]_D :
RC[0E]_0 :
RC[0F]_0 :
RC[0D]_0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_KC[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]
D-D.AND.KC[.FF00]
104E: D-D.OR.KC[.4],J/CALLCON
ERROR2: D_RC[0F]
D-D.AND.KC[.FF00]
105A: D-D.OR.KC[.6],J/CALLCON
105E: D-D.AND.KC[.FF00]
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

U 105E. 0000.003C.1D80.3C00.0000.105E :1908

+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 13F0. 0000.003C.0180.0800.0000.13F1 :1912
U 13F1. 0000.003C.0180.0800.0000.13F2 :1913
U 13F2. 0000.003C.0180.0800.0000.13F3 :1914
U 13F3. 0000.003C.0180.0800.0000.13F4 :1915

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

U 13F4. 0000.003C.0180.0800.0000.13F5 :1916
U 13F5. 0000.003C.0180.0800.0000.13F6 :1917
U 13F6. 0000.003C.0180.0800.0000.13F7 :1918
U 13F7. 0000.003C.0180.0800.0000.13F8 :1919
U 13F8. 0000.003C.0180.0800.0000.13F9 :1920
U 13F9. 0000.003C.0180.0800.0000.13FA :1921
U 13FA. 0000.003C.0180.0800.0000.13FB :1922
U 13FB. 0000.003C.0180.0800.0000.13FC :1923
U 13FC. 0000.003C.0180.0800.0000.13FD :1924
U 13FD. 0000.003C.0180.0800.0000.13FE :1925
U 13FE. 0000.003C.0180.0800.0000.13FF :1926
U 13FF. 0000.003C.0180.0800.0000.1155 :1927
U 1155. 0000.003C.0180.0800.0000.12AA :1928
U 12AA. 0000.003C.0180.0800.0000.124B :1929

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

:+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.

U 124B. 0810.0038.4D80.0978.0000.124C :1930
U 124C. 0019.4016.4D80.09F8.0000.0001 :1931

SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

:+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

U 124D. 0010.0038.01C0.0978.0000.124E :1932
U 124E. 0019.2034.4DC0.0800.0000.124F :1933
U 124F. 0019.2032.1D80.09F8.0000.0001 :1934

SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.

U 1250. 0018.0038.C180.0800.0000.1058 :1935
U 1058. 0500.003D.0380.0800.0000.1262 :1936
U 1059. 0000.003C.0180.0800.0000.1263 :1937

DC.1DE: ALU_K[.FFFF]
=0 D D.LEFT,S1/7,CALL,J/DCD
J7DCE

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

U 1251. 0118.0038.1B80.0800.0000.1265 :1938
U 1252. 0118.0038.0B80.0800.0000.1265 :1939
U 1253. 0118.0038.0780.0800.0000.1265 :1940
U 1254. 0118.0038.C380.0800.0000.1265 :1941
U 1255. 0018.0038.1980.0800.0000.1251 :1942
U 1256. 0018.0038.1980.0800.0000.1252 :1943
U 1257. 0018.0038.1980.0800.0000.1253 :1944
U 1258. 0018.0038.1980.0800.0000.1254 :1945
U 1259. 0018.0038.0980.0800.0000.1251 :1946
U 125A. 0018.0038.0980.0800.0000.1252 :1947
U 125B. 0018.0038.0980.0800.0000.1253 :1948
U 125C. 0018.0038.0980.0800.0000.1254 :1949
U 125D. 0018.0038.0580.0800.0000.1251 :1950
U 125E. 0018.0038.0580.0800.0000.1252 :1951
U 125F. 0018.0038.0580.0800.0000.1253 :1952
U 1260. 0018.0038.0580.0800.0000.1254 :1953
U 1261. 0018.0038.C180.0800.0000.1251 :1954

S00: ALU_O(K),D D.LEFT2,S1/7,J/SX
S01: ALU_K[.2],D D.LEFT2,S1/7,J/SX
S10: ALU_K[.1],D D.LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D D.LEFT2,S1/7,J/SX
DC0: ALU_O(K),J/S00
DC1: ALU_O(K),J/S01
DC2: ALU_O(K),J/S10
DC3: ALU_O(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00

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U 1262, 0018,0038,C180,0800,0000,1252 :1971 DCD: ALU_K[.FFFF],J/S01
U 1263, 0018,0038,C180,0800,0000,1253 :1972 DCE: ALU_K[.FFFF],J/S10
U 1264, 0018,0038,C180,0800,0000,1254 :1973 DCF: ALU_K[.FFFF],J/S11
U 1265, 0100,003E,0380,0800,0000,0001 :1974 SX: D_D.LEFT2,SI/7,RETURN1
U 1266, 0018,0038,01C0,0800,0000,105C :1975 DC.5: Q_K[.8]
:1976 =0
U 105C, 0000,003D,0180,0800,0000,125A :1977 DC.5A: CALL,J/DC5
U 105D, 0019,2000,05C0,0800,0010,1267 :1978 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1267, 0000,013C,0180,0800,0000,10F8 :1979 Z?
U 10F8, 0000,003C,0180,0800,0000,105C :1980 =0
U 10F9, 0000,003E,0180,0800,0000,0001 :1981 J/DC.5A
:1982 RETURN1
U 10FA, 0000,003D,0180,0800,0000,1266 :1983 DC.A: CALL,J/DC.5
U 10FB, 0500,003E,0180,0800,0000,0001 :1984 D_D.LEFT,SI/ZERO,RETURN1
U 1268, 0018,0038,01C0,0800,0000,10FC :1985 DC.9: Q_K[.8]
:1986 =0
U 10FC, 0000,003D,0180,0800,0000,125E :1987 DC.9A: CALL,J/DC9
U 10FD, 0019,2000,05C0,0800,0010,1269 :1988 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1269, 0000,013C,0180,0800,0000,10FE :1989 Z?
U 10FE, 0000,003C,0180,0800,0000,10FC :1990 =0
U 10FF, 0000,003E,0180,0800,0000,0001 :1991 J/DC.9A
:1992 RETURN1
U 110A, 0000,003D,0180,0800,0000,1268 :1993 DC.C: CALL,J/DC.9
U 110B, 0018,0038,C180,0800,0000,126A :1994 ALU_K[.FFFF]
U 126A, 0600,003E,0380,0800,0000,0001 :1995 D_D.RIGHT,SI/7,RETURN1
:1996 =0
U 1110, 0000,003D,0180,0800,0000,1268 :1997 DC.6: CALL,J/DC.9
U 1111, 0018,0038,0580,0800,0000,126B :1998 ALU_K[.1]
U 126B, 0100,003E,0380,0800,0000,0001 :1999 D_D.LEFT2,SI/7,RETURN1
:2000 =0
U 1112, 0000,003D,0180,0800,0000,1268 :2001 DC.3: CALL,J/DC.9
U 1113, 0018,0038,C180,0800,0000,126C :2002 ALU_K[.FFFF]
U 126C, 0500,003E,0380,0800,0000,0001 :2003 D_D.LEFT,SI/7,RETURN1
:2004 ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.
U 126D, 0F18,0038,5DC0,0800,0000,1114 :2005 DCLA: D_0,Q_K[.7]
:2006 =0
U 1114, 0000,003D,0180,0800,0000,125F :2007 DCLA1: CALL,J/DCA
U 1115, 0001,203C,0180,0800,0010,126E :2008 ALU_Q,CLK.UBCC
U 126E, 0000,013C,0180,0800,0000,1116 :2009 Z?
U 1116, 0019,2000,05C0,0800,0000,1114 :2010 =0
U 1117, 0000,003E,0180,0800,0000,0001 :2011 Q_Q-K[.1],J/DCLA1
:2012 RETURN1
:2013 ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
:2014 ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
:2015 ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
:2016 ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
:2017 ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
:2018 ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
:2019 ; WILL CONTAIN THE READ DATA.
:2020 =0
U 1118, 0F00,003D,0180,0800,0000,125B :2020 RHOM1: D_0,CALL,J/DC6
U 1119, 0000,003C,0180,0800,0000,111F :2021 J7READ
:2022 =0
U 111A, 0F00,003D,0180,0800,0000,1257 :2023 RHOM1: D_0,CALL,J/DC2
U 111B, 0000,003C,0180,0800,0000,111F :2024 J7READ
:2025 =0
```

```

U 111C, 0F00,003D,0180,08C0,0000,1259 :2026
U 111D, 0000,003C,0180,0800,0000,111F :2027
:2028
U 111E, 0F00,003C,0180,0800,0000,111F :2029
U 111F, 0000,003C,01F8,0800,0084,726F :2030
U 126F, 0D00,003C,0180,0800,0000,1270 :2031
U 1270, 0001,003C,0180,09E8,0000,1271 :2032
U 1271, 0818,0038,6180,0800,0084,7272 :2033
U 1272, 0000,003C,09F8,0800,0084,8273 :2034
U 1273, 0D00,003C,75F0,2C00,0000,1274 :2035
U 1274, 001D,0034,01C0,0800,0000,1275 :2036
U 1275, 0810,0038,0180,0968,0000,1276 :2037
U 1276, 001D,0030,0180,09E8,0000,1277 :2038
U 1277, 0000,003C,0180,0A70,0000,1278 :2039
U 1278, 0000,003C,0180,52F8,0000,1279 :2040
U 1279, 0001,003C,0180,09D0,0000,127A :2041
U 127A, 0000,003C,75F0,2C00,0000,127B :2042
U 127B, 0800,003C,0180,0A78,0000,127C :2043
U 127C, 0003,003C,0180,0AF8,0000,127D :2044
U 127D, 0001,203C,0180,09E0,0000,127E :2045
U 127E, 0000,003C,01C0,0A70,0000,127F :2046
U 127F, 0001,003C,0180,09C8,0000,1280 :2047
U 1280, 001D,2000,0180,0800,0010,1281 :2048
U 1281, 0000,013C,0180,0800,0000,1120 :2049
U 1120, 0000,003C,0180,0800,0000,1289 :2050
U 1121, 0818,0038,05F8,0800,0000,1282 :2051
U 1282, 0000,003C,0180,0800,0084,7283 :2052
U 1283, 0D10,0038,01C0,0960,0000,1284 :2053
U 1284, 001D,2034,01C0,0800,0000,1285 :2054
U 1285, 0810,0038,0180,0968,0000,1286 :2055
U 1286, 0819,0034,9180,0800,0000,1287 :2056
U 1287, 001D,2000,0180,0800,0010,1288 :2057
U 1288, 0010,0138,01C0,0958,0000,1122 :2058
U 1122, 0000,003E,0180,0800,0000,0002 :2059
U 1123, 0810,003A,0180,0950,0000,0003 :2060
U 1289, 0000,003C,79F0,2C00,0000,128A :2061
U 128A, 0001,203E,0180,09E8,0000,0001 :2062
:2063
U 128B, 0000,003C,0180,0A70,0000,128C :2066
U 128C, 0000,003C,0180,32F8,0000,128D :2067
U 128D, 0800,003C,0180,0A78,0000,128E :2068
U 128E, 0003,003C,0180,0AF8,0000,128F :2069
U 128F, 0000,003C,01C0,0A70,0000,1290 :2070
U 1290, 001D,2000,0180,0800,0010,1291 :2071
U 1291, 0000,013C,0180,0800,0000,1124 :2072
U 1124, 0000,003C,0180,0800,0000,1289 :2073
U 1125, 0000,003E,0180,0800,0000,0002 :2074
:2075
:2076
:2077
:2078
:2079
U 1292, 0F00,003C,0180,0800,0000,1293 :2080

```

```

RMOH1: D_0,CALL,J/DC4
J7READ
=0
RMOM1: D_0,J/READ
READ: SC_K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
D_BAL.SC
RC[OD] D
D_K[.F],SC_K[.F] ; CALCULATE THE EXPECTED FORCE MISS
SC_SC-K[.2],Q_0 ; AND THE EXPECTED FORCE REPLACE BITS
D_BAL.SC,Q_ID[MAINT]
ACU_D[AND]Q,Q_ALU
D_RC[OD]
ACU_D[OR]Q,RC[OD],ALU
LAB_RC[OE]
RC[OF] LA,FS/MCT,MCT/READ.V.WCHK
RC[OA] D
Q_ID[MAINT]
D_RC[OF]
RC[OF] 0
RC[OC] Q
Q_RC[OE]
RC[9] D
ALU_Q=D,CLK.UBCC
Z?
=0
J/RERR
Q_0,D_K[.6]
SC_K[.8]
D_BAL.SC,Q_RC[OC]
ACU_Q[AND]Q,Q_ALU
D_RC[OD]
ACU_D[AND]K[.1F00],D_ALU ; AND OUT EVERYTHING BUT HIT MISS BITS
ALU_Q=D,CLK.UBCC
Z?,Q_RC[OB]
=0
RETURN2
D_RC[OA],RETURN3
RERR: Q_ID[PARITY]
RC[OD] Q,RETURN1
; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
; ELSE RETURN2.
WRITE: LAB_RC[OE]
RC[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
D_RC[OF]
RC[OF] 0
Q_RC[OE]
ACU_Q=D,CLK.UBCC
Z?
=0
J/RERR ; UTRAPPED.
RETURN2 ; OK NO UTRAP.
; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
; DISSABLE SBI CYCLES:
SOFF: D_0

```



```

U 1293, 0000,003C,8580,0800,0084,7294 :2081
U 1294, 0801,001C,0180,0800,0000,1295 :2082
U 1295, 0000,003E,7580,3C00,0000,0001 :2083
:2084
U 1296, 0F00,003C,0180,0800,0000,1297 :2085
U 1297, 0000,003C,6180,0800,0084,7298 :2086
U 1298, 0000,003C,0580,0800,0084,8299 :2087
U 1299, 0801,001C,0180,0800,0000,1293 :2088
:2089
U 129A, 0F00,003C,0180,0800,0000,129B :2090
U 129B, 0000,003C,8980,0800,0084,7299 :2091
:2092
U 129C, 0F00,003C,0180,0800,0000,129D :2093
U 129D, 0000,003C,6580,0800,0084,7299 :2094
:2095
U 129E, 0F00,003C,0180,0800,0000,129F :2096
U 129F, 0000,003C,6180,0800,0084,7299 :2097
:2098
U 12A0, 0F00,003C,0180,0800,0000,12A1 :2099
U 12A1, 0000,003C,6180,0800,0084,72A2 :2100
U 12A2, 0801,001C,0180,0800,0000,129D :2101
:2102
U 12A3, 0F00,003C,0180,0800,0000,12A4 :2103
U 12A4, 0000,003C,6180,0800,0084,72A5 :2104
U 12A5, 0801,001C,0180,0800,0000,1297 :2105
:2106
U 12A6, 0F00,003C,8980,0800,0084,72A2 :2107
:2108
:2109
:2110
:2111
:2112
:2113
:2114
:2115
:2116
:2117
:2118
U 12A7, 0F16,0038,5DC0,0800,0000,1126 :2119
:2120
U 1126, 0000,003D,0180,0800,0000,125F :2121
U 1127, 0001,203C,0180,0800,0010,12A8 :2122
U 12A8, 0000,013C,0180,0800,0000,1128 :2123
U 1128, 0019,2000,05C0,0800,0000,1126 :2124
U 1129, 0001,003C,0180,0980,0000,12A9 :2125
U 12A9, 0001,0028,0180,0990,0000,12AB :2126
U 12AB, 0F18,0038,5DC0,0800,0000,112A :2127
:2128
U 112A, 0000,003D,0180,0800,0000,125E :2129
U 112B, 0001,203C,0180,0800,0010,12AC :2130
U 12AC, 0000,013C,0180,0800,0000,112C :2131
U 112C, 0019,2000,05C0,0800,0000,112A :2132
U 112D, 0001,003C,0180,09A0,0000,12AD :2133
U 12AD, 0001,0028,0180,0980,0000,12AE :2134
U 12AE, 0000,003C,89F8,0800,0084,72AF :2135

```

```

S1: SC_K[C]
ALU_D,ORNOT.MASK,D,ALU
ID[MAINT],D,RETURN
: SET FORCE REPLACE GROUP ZERO BIT
ROS: D_0
S2: SC_K[F]
SC-SC-K[.1]
S3: ALU_D,ORNOT.MASK,D,ALU,J/S1
: SET FORCE REPLACE GROUP T BIT
RIS: D_0
S4: SC_K[D],J/S3
: SET FORCE MISS GROUP 0 BIT
MOS: D_0
S5: SC_K[.10],J/S3
: SET FORCE MISS GROUP 1 BIT
MIS: D_0
S6: SC_K[F],J/S3
: SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
M1OS: D_0
S7: ALU_D,ORNOT.MASK,D,ALU,J/S5
: SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
ROMIS: D_0
SC_K[F]
ALU_D,ORNOT.MASK,D,ALU,J/S2
: SET FORCE REPLACE GROUP T FORCE MISS GROUP 0 BITS
R1MOS: D_0,SC_K[D],J/S7
: THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
: PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
: THESE PATTERNS IN THE RC SCRATCH PADS.
: RC[0] AAAAAAAA
: RC[1] 19999000
: RC[2] 55555555
: RC[3] 06666000
: RC[4] 99999999
: RC[5] 1B6DB000
: RC[6] 66666666
: RC[7] 04924000
CAPAT: Q_K[.7],D_0
=0
CAP1: CALL,J/DCA
ALU_Q,CLK,UBCC
Z?
=0 Q-Q-K[.1],J/CAP1
RC[0] D
ALU_NOT.D,RC[2],ALU
Q_K[.7],D_0
=0
CAP2: CALL,J/DC9
ALU_Q,CLK,UBCC
Z?
=0 Q-Q-K[.1],J/CAP2
RC[4] D
ALU_NOT.D,RC[6],ALU
Q_0,SC_K[D]

```



```

U 12AF, 0D00,003C,0180,0800,0000,12B0 :2136
U 12B0, 0600,003C,0180,0800,0000,12B1 :2137
U 12B1, 0001,003C,0180,0988,0000,12B2 :2138
U 12B2, 0810,0038,65F8,0930,0084,72B3 :2139
U 12B3, 0D00,003C,0180,0800,0000,12B4 :2140
U 12B4, 0200,003C,0180,0800,0000,12B5 :2141
U 12B5, 0200,003C,0180,0800,0000,12B6 :2142
U 12B6, 0F01,003C,0180,0998,0000,112E :2143
U 112E, 0000,003D,0180,0800,0000,125E :2144
U 112F, 0100,003C,0180,0800,0000,1130 :2145
U 1130, 0000,003D,0180,0800,0000,125E :2146
U 1131, 0500,003C,0180,0800,0000,1132 :2147
U 1132, 0000,003D,0180,0800,0000,1259 :2148
U 1133, 0001,0028,0180,09A8,0000,12B7 :2149
U 12B7, 0000,003C,85F8,0800,0084,72B8 :2150
U 12B8, 0D00,003C,0180,0800,0000,12B9 :2151
U 12B9, 0001,003C,0180,0988,0000,12BA :2152
U 12BA, 0810,0038,0180,0928,0000,12BB :2153
U 12BB, 0000,003C,61F8,0800,0084,72BC :2154
U 12BC, 0D00,003C,0180,0800,0000,12BD :2155
U 12BD, 0200,003C,0180,0800,0000,12BE :2156
U 12BE, 0600,003C,0180,0800,0000,12BF :2157
U 12BF, 0001,003E,0180,09A8,0000,0001 :2158

```

=0

=0

=0

```

D_DAL.SC
D_D.RIGHT,SI/ZERO
RC[1] D
D_RC[8],SC_K[.10],Q_0
D_DAL.SC
D_D.RIGHT2,SI/ZERO
D_D.RIGHT2,SI/ZERO
RC[3] D,D 0
CALL,J/DC9
D_D.LEFT2,SI/ZERO
CALL,J/DC9
D_D.LEFT,SI/ZERO
CALL,J/DC4
ALU NOT,D,RC[5],ALU
SC_RC[C],Q_0
D_DAL.SC
RC[7] D
D_RC[5]
SC_K[F],Q_0
D_DAL.SC
D_D.RIGHT2,SI/ZERO
D_D.RIGHT,SI/ZERO
RC[5]_D,RETURN1

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```

2159 .PAGE "TEST CE CACHE WRITE PULSE LOGIC TEST"
2160 .....
2161 **
2162 TEST CE CACHE WRITE PULSE TEST
2163
2164 TEST DESCRIPTION
2165 THIS IS A TEST OF THE CACHE WRITE PULSE LOGIC. TESTED HERE
2166 WRITE PULSES GENERATED BY CACHE INVALIDATE (USING THE MCT COMMAND)
2167 CACHE WRITE VALID (INCLUDING FORCE REPLACE AND RANDOM REPLACE),
2168 AND WRITE HITS. ALSO TESTED ARE THE CACHE HIT/MISS BITS IN
2169 THE SBI MAINTENANCE REGISTER AND SIMPLE ONES AND ZEROES
2170 DATA PATTERNS IN CACHE LOCATION 'ZERO' (PA<11:03>=0) IN BOTH
2171 GROUPS.
2172 ASSUMING 4 TEST ADDRESS PATTERNS: A1=19999000
2173 A2=06666000
2174 A3=1B6DB000
2175 A4=04924000
2176
2177 AND 4 TEST DATA PATTERNS: D1=AAAAAAA
2178 D2=5555555
2179 D3=99999999
2180 D4=66666666
2181
2182 THE TEST SEQUENCE OF EVENTS IS:
2183 1 INVALIDATE PA=0 IN BOTH GROUPS
2184 2 READ ADDRESS 0 AND CHECK FOR MISS IN BOTH GROUPS
2185 3 VALIDATE A1 (WITH DATA D1) IN GROUP 0
2186 4 VALIDATE A2 (WITH DATA D2) IN GROUP 1
2187 5 READ A1, CHECK FOR HIT IN GROUP 0 AND DATA=D1
2188 6 READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D2
2189 7 VALIDATE A3 (WITH DATA D3) IN GROUP 0
2190 8 READ A1 AND CHECK FOR MISS IN BOTH GROUPS
2191 9 READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D3
2192 A READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D2
2193 B VALIDATE A4 (WITH DATA D4) IN GROUP 1
2194 C READ A2 AND CHECK FOR MISS IN BOTH GROUPS
2195 D READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D4
2196 E READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D3
2197 F WRITE A3 (WITH DATA D1), A3 ALREADY A HIT IN GROUP 0
2198 10 READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
2199 11 READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D4
2200 12 WRITE A4 (WITH DATA D2), A4 ALREADY A HIT IN GROUP 1
2201 13 READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D2
2202 14 READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
2203 15 SET FORCE MISS GROUP 0 BIT
2204 16 READ A3 AND CHECK FOR MISS TO BOTH GROUPS
2205 17 READ A4 AND CHECK FOR HIT IN GROUP 1 AND DATA=D2
2206 18 CLEAR FORCE MISS BITS
2207 19 READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
2208 1A SET FORCE MISS GROUP 1 BIT
2209 1B READ A4 AND CHECK FOR MISS TO BOTH GROUPS
2210 1C READ A3 AND CHECK FOR HIT IN GROUP 0 WITH DATA=D1
2211 1D CLEAR FORCE MISS BITS
2212 1E READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D2
2213 1F MAKE RANDOM FLIP FLOP POINT TO GROUP 0 BY SETTING
AND THEN CLEARING THE FORCE REPLACE GROUP 0
BIT IN THE MAINTENANCE REGISTER:

```

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:2214 : 20 VALIDATE A1 (WITH DATA D3) THIS WRITE SHOULD
:2215 : GO INTO GROUP 0.
:2216 : 21 VALIDATE A2 (WITH DATA D4) THIS WRITE SHOULD
:2217 : GO INTO GROUP 1
:2218 : 22 READ A1, CHECK FOR HIT IN GROUP 0 AND DATA=D3
:2219 : 23 READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D4
:2220 : 24 MAKE RANDOM FLIP FLOP POINT TO GROUP 1 BY SETTING
:2221 : AND THEN CLEARING THE FORCE REPLACE GROUP 1
:2222 : BIT IN THE MAINTENANCE REGISTER
:2223 : 25 VALIDATE A3 (WITH DATA D1) THIS WRITE SHOULD
:2224 : GO INTO GROUP 1
:2225 : 26 VALIDATE A4 (WITH DATA D2) THIS WRITE SHOULD
:2226 : GO INTO GROUP 0
:2227 : 27 READ A3, CHECK FOR HIT IN GROUP 1 AND DATA=D1
:2228 : 28 READ A4, CHECK FOR HIT IN GROUP 0 AND DATA=D2
:2229 :
:2230 :
:2231 :
:2232 :
:2233 :
:2234 :
:2235 :
:2236 :
:2237 :
:2238 :
:2239 :
:2240 :
:2241 :
:2242 :
:2243 :
:2244 :
:2245 :
:2246 :
:2247 :
:2248 :
:2249 :
:2250 :
:2251 :
:2252 :
:2253 :
:2254 :
:2255 :
:2256 :
:2257 :
:2258 :
:2259 :
:2260 :
:2261 :
:2262 :
:2263 :
:2264 :
:2265 :
:2266 :
:2267 :
:2268 :
    
```

DONE

LOGIC DESCRIPTION

TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
 REGISTER ON THE SBI CONTROL MODULE.

ERROR DESCRIPTION

VA REFERENCED
 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
 ONLY THE HIT/MISS AND FORCE MISS AND FORCE REPLACE
 BITS ARE RELEVANT)
 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
 UTRAP OCCURS

GOT CACHE MAINT REGISTER

EXPECTED READ DATA

GOT READ DATA

UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:

FLAG	UTRAP TYPE
----	-----
1DE	NO UTRAP OCCURRED
DE	CACHE PARITY UTRAP
15E	TB PARITY ERROR
19E	TB MISS
1CE	TB PROTECTION ERROR
1D6	TB MODIFY BIT ERROR
1DA	X PAGE UTRAP
1DC	UNALIGNED DATA UTRAP

ERROR CODE: (FOR FAILCHAIN)

0=> ERROR OCCURRED IN SEQUENCE #'S 1 OR 2
 1=> ERROR OCCURRED BEYOND SEQUENCE 3

--

```

:2269 =0
U 1134, 0000,003D,0180,0800,0000,1233 :2270 CWP: NEWTST
U 1135, 0F18,0038,5D80,09F8,0000,1136 :2271 D 0,RC[0F] K[7]
U 1136, 0000,003D,4980,3C00,0000,12A7 :2272 =0 ID[1BER0]_D,CALL,J/CAPAT ; TURN OFF THE TB
:2273 ; AND GO GENERATE SOME
:2274 ; SIMPLE 1'S AND 0'S DATA
:2275 ; AND ADDRESS PATTERNS.
U 1137, 0F03,003C,0180,0AF8,0000,1138 :2276 RC[0F] 0,D 0
U 1138, 0000,003D,0180,0800,0000,1250 :2277 =0 CALL,J/DC:1DE
U 1139, 0001,003C,0180,0AF0,0000,12C0 :2278 RC[0E]_D
U 12C0, 0003,003C,0180,09C0,0000,113A :2279 RC[8]_0 ; ERROR CODE
U 113A, 0000,003D,0180,0800,0000,1292 :2280 =0 CALL,J/SOFF ; DISABLE SBI CYCLES
:2281 ;////////////////////
:2282 ;+
:2283 ;[1] INVALIDATE LOCATION 0 OF BOTH GROUPS
:2284 ;-
U 113B, 0018,0038,1980,09F0,0200,12C1 :2285 VA K[ZERO],RC[0E] K[ZERO]
U 12C1, 0000,003C,0180,9000,0000,1004 :2286 FS/MCT,MCT/INVALIDATE ; WRITE GOOD PARITY INTO
:2287 ; CACHE LOCATION ZERO OF BOTH
:2288 ; GROUPS.
:2289 ;////////////////////
:2290 ;+
:2291 ;[2] READ ADDRESS 0 WHICH SHOULD BE MISS IN BOTH GROUPS
:2292 ;-
U 1004, 0000,003D,0180,0800,0000,111E :2293 =00 CALL,J/RMOM1 ; READ THE LOCATION BACK TO
:2294 ; INSURE THAT IT IS A MISS
:2295 ; AND THAT IT INDEED HAS
:2296 ; GOOD PARITY.
U 1005, 0000,003D,0180,0800,0000,1247 :2297 ERROR1 ; A MICRO TRAP OCCURRED ON THE REFER.
U 1006, 0000,003D,0180,0800,0000,1247 :2298 ERROR1 ; THE HIT AND MISS BITS IN THE
:2299 ; SBI MAINTENANCE REGISTER ARE
:2300 ; INCORRECT.
U 1007, 0000,003C,0180,0800,0000,12C2 :2301 NOP ; OK NO UTRAP OR HIT BIT SET.
:2302 ;////////////////////
:2303 ;+
:2304 ;[3] VALIDATE ADDRESS 19999000 AND DATA AAAAAAAA IN GROUP 0
:2305 ;-
U 12C2, 0018,0038,0580,09C0,0000,113C :2306 RC[8] K[.1] ; ERROR CODE
U 113C, 0000,003D,0180,0800,0000,1296 :2307 =0 CALL,J/R0S ; SET THE FORCE REPLACE GROUP ZERO BIT.
U 113D, 0010,0038,0180,0908,0200,12C3 :2308 VA RC[1] ; MAKE RC[1] AND DATA RC[0] A HIT IN GROUP 0
U 12C3, 0810,0038,0180,0900,0000,12C4 :2309 D RC[0]
U 12C4, 0000,003C,0180,9800,0000,113E :2310 FS/MCT,MCT/VALIDATE
:2311 ;////////////////////
:2312 ;+
:2313 ;[4] VALIDATE ADDRESS 06666000 AND DATA 55555555 IN GROUP 1
:2314 ;-
U 113E, 0000,003D,0180,0800,0000,129A :2315 =0 CALL,J/R1S ; SET THE FORCE REPLACE BIT FOR GROUP 1.
U 113F, 0010,0038,0180,0918,0200,12C5 :2316 VA RC[3] ; MAKE RC[3] AND DATA RC[2] A HIT IN GROUP 1.
U 12C5, 0810,0038,0180,0910,0000,12C6 :2317 D RC[2]
U 12C6, 0000,003C,0180,9800,0000,12C7 :2318 FS/MCT,MCT/VALIDATE
:2319 ;////////////////////
:2320 ;+
:2321 ;[5] READ ADDRESS 19999000 AND CHECK FOR HIT IN GROUP 0 AND
:2322 ; DATA AAAAAAAA
:2323 ;-

```



```

U 12C7, 0810,0038,0180,0908,0200,12C8 :2324
U 12C8, 0001,003C,0180,09F0,0000,12C9 :2325
U 12C9, 0010,0038,01C0,0900,0000,1008 :2326
U 1008, 0001,203D,0180,09D8,0000,111A :2327
U 1009, 0000,003D,0180,0800,0000,1247 :2328
U 100A, 0000,003D,0180,0800,0000,1247 :2329
U 100B, 001D,2000,0180,0800,0010,12CA :2330
U 12CA, 0000,013C,0180,0800,0000,1140 :2331
U 1140, 0000,003D,0180,0800,0000,1247 :2332
:2333
:2334
:2335
:2336
:2337
U 1141, 0810,0038,0180,0918,0200,12CB :2338
U 12CB, 0001,003C,0180,09F0,0000,12CC :2339
U 12CC, 0010,0038,01C0,0910,0000,100C :2340
U 100C, 0001,203D,0180,09D8,0000,111C :2341
U 100D, 0000,003D,0180,0800,0000,1247 :2342
U 100E, 0000,003D,0180,0800,0000,1247 :2343
U 100F, 001D,2000,0180,0800,0010,12CD :2344
U 12CD, 0000,013C,0180,0800,0000,1142 :2345
U 1142, 0000,003D,0180,0800,0000,1247 :2346
U 1143, 0000,003C,0180,0800,0000,1144 :2347
:2348
:2349
:2350
:2351
:2352
U 1144, 0000,003D,0180,0800,0000,1296 :2353
U 1145, 0010,0038,0180,0928,0200,12CE :2354
U 12CE, 0810,0038,0180,0920,0000,12CF :2355
U 12CF, 0000,003C,0180,9800,0000,12D0 :2356
:2357
:2358
:2359
:2360
U 12D0, 0810,0038,0180,0908,0200,12D1 :2361
U 12D1, 0001,003C,0180,09F0,0000,1010 :2362
U 1010, 0000,003D,0180,0800,0000,111E :2363
U 1011, 0000,003D,0180,0800,0000,1247 :2364
U 1012, 0000,003D,0180,0800,0000,1247 :2365
:2366
:2367
:2368
:2369
:2370
U 1013, 0810,0038,0180,0928,0200,12D2 :2371
U 12D2, 0001,003C,0180,09F0,0000,12D3 :2372
U 12D3, 0010,0038,01C0,0920,0000,1014 :2373
U 1014, 0001,203D,0180,09D8,0000,111A :2374
U 1015, 0000,003D,0180,0800,0000,1247 :2375
U 1016, 0000,003D,0180,0800,0000,1247 :2376
U 1017, 001D,2000,0180,0800,0010,12D4 :2377
U 12D4, 0000,013C,0180,0800,0000,1146 :2378

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```

VA_RC[1],D_RC[1]
RC[0E] D
Q RC[0]
=00 CALL,J/RHOM1,RC[0B]_Q : CHECK THE GROUP0 HIT AND DATA.
ERROR1 : UTRAPPED
ERROR1 : HIT MISS BITS INCORRECT
ALU_Q-D,CLK.UBCC
Z?
=0 ERROR1 : DATA INCORRECT.
:////////////////////
:2333
:2334
:2335 [6] READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1 AND
:2336 DATA 55555555
:2337
:2338
VA_RC[3],D_RC[3]
RC[0E] D
Q RC[2]
=00 CALL,J/RHOM1,RC[0B]_Q : CHECK THE GROUP1 HIT AND DATA.
ERROR1 : UTRAPPED
ERROR1 : HIT MISS BITS INCORRECT.
ALU_Q-D,CLK.UBCC
Z?
=0 ERROR1 : DATA INCORRECT.
NOP
:////////////////////
:2348
:2349
:2350 [7] VALIDATE ADDRESS 1B6DB000 WITH DATA 99999999 IN GROUP 0
:2351 OVERWRITE THE GROUP 0 HIT AND CHECK FOR WRITE ONLY TO GROUP 0
:2352
:2353
=0 CALL,J/ROS : FORCE REPLACEMENT OF GROUP 0
VA_RC[5]
D_RC[4]
FS/MCT,MCT/VALIDATE
:////////////////////
:2357
:2358
:2359 [8] READ ADDRESS 19999000 AND CHECK FOR MISS TO BOTH GROUPS
:2360
:2361
VA_RC[1],D_RC[1]
RC[0E] D
=00 CALL,J/RHOM1 : CHECK FOR MISS AT OLD ADDRESS
ERROR1 : UTRAPPED
ERROR1 : HIT MISS BITS INCORRECT
:////////////////////
:2366
:2367
:2368 [9] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 AND
:2369 DATA 99999999
:2370
:2371
VA_RC[5],D_RC[5]
RC[0E] D
Q RC[4]
=00 CALL,J/RHOM1,RC[0B]_Q : CHECK FOR HIT AT NEW ADDRESS IN GROUP 0
ERROR1 : UTRAPPED
ERROR1 : HIT MISS BITS INCORRECT
ALU_Q-D,CLK.UBCC
Z?

```

```

U 1146, 0000,003D,0180,0800,0000,1247 :2379 =0 ERROR1 ; DATA INCORRECT
:2380 :////////////////////
:2381 :+
:2382 :[A] READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1 AND
:2383 :DATA 55555555
:2384 :-
U 1147, 0810,0038,0180,0918,0200,12D5 :2385 VA_RC[3],D_RC[3]
U 12D5, 0001,003C,0180,09F0,0000,12D6 :2386 RC[0E] D
U 12D6, 0010,0038,01C0,0910,0000,1018 :2387 Q_RC[2]
U 1018, 0001,203D,0180,09D8,0000,111C :2388 =00 CALL,J/RMOW1,RC[0B]_Q ; CHECK FOR GROUP ONE INTEGRITY
:2389 : AFTER WRITE TO GROUP 0.
U 1019, 0000,003D,0180,0800,0000,1247 :2390 ERROR1 ; UTRAPPED
U 101A, 0000,003D,0180,0800,0000,1247 :2391 ERROR1 ; HIT MISS BITS INCORRECT
U 101B, 001D,2000,0180,0800,0010,12D7 :2392 ALU_Q-D,CLK.UBCC
U 12D7, 0000,013C,0180,0800,0000,1148 :2393 Z?
U 1148, 0000,003D,0180,0800,0000,1247 :2394 =0 ERROR1 ; DATA IN GROUP 1 INCORRECT.
U 1149, 0000,003C,0180,0800,0000,114A :2395 NOP
:2396 :////////////////////
:2397 :+
:2398 :[B] VALIDATE ADDRESS 04924000 WITH DATA 66666666 IN GROUP 1
:2399 :OVERWRITE GROUP 1 HIT AND CHECK FOR WRITE ONLY TO GROUP 1
:2400 :-
U 114A, 0000,003D,0180,0800,0000,129A :2401 =0 CALL,J/R1S
U 114B, 0010,0038,0180,0938,0200,12D8 :2402 VA_RC[7]
U 12D8, 0810,0038,0180,0930,0000,12D9 :2403 D_RC[6]
U 12D9, 0000,003C,0180,9800,0000,12DA :2404 FS/MCT,MCT/VALIDATE
:2405 :////////////////////
:2406 :+
:2407 :[C] READ ADDRESS 06666000 AND CHECK FOR MISS IN BOTH GROUPS
:2408 :-
U 12DA, 0810,0038,0180,0918,0200,12DB :2409 VA_RC[3],D_RC[3]
U 12DB, 0001,003C,0180,09F0,0000,101C :2410 RC[0E] D
U 101C, 0000,003D,0180,0800,0000,111E :2411 =00 CALL,J7RMOM1 ; CHECK FOR MISS AT OLD ADDRESS
U 101D, 0000,003D,0180,0800,0000,1247 :2412 ERROR1 ; UTRAPPED
U 101E, 0000,003D,0180,0800,0000,1247 :2413 ERROR1 ; HIT MISS BITS INCORRECT
:2414 :////////////////////
:2415 :+
:2416 :[D] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 AND
:2417 :DATA 66666666
:2418 :-
U 101F, 0810,0038,0180,0938,0200,12DC :2419 VA_RC[7],D_RC[7]
U 12DC, 0001,003C,0180,09F0,0000,12DD :2420 RC[0E] D
U 12DD, 0010,0038,01C0,0930,0000,1020 :2421 Q_RC[6]
U 1020, 0001,203D,0180,09D8,0000,111C :2422 =00 CALL,J/RMOW1,RC[0B]_Q ; CHECK FOR HIT IN GROUP 1 AT NEW ADDR.
U 1021, 0000,003D,0180,0800,0000,1247 :2423 ERROR1 ; UTRAPPED
U 1022, 0000,003D,0180,0800,0000,1247 :2424 ERROR1 ; HIT MISS BITS INCORRECT.
U 1023, 001D,2000,0180,0800,0010,12DE :2425 ALU_Q-D,CLK.UBCC
U 12DE, 0000,013C,0180,0800,0000,114C :2426 Z?
U 114C, 0000,003D,0180,0800,0000,1247 :2427 =0 ERROR1 ; GROUP 1 DATA INCORRECT.
:2428 :////////////////////
:2429 :+
:2430 :[E] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 AND
:2431 :DATA 99999999
:2432 :-
U 114D, 0810,0038,0180,0928,0200,12DF :2433 VA_RC[5],D_RC[5]

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U 12DF, 0001,003C,0180,09F0,0000,12E0 :2434 RC[0E] D
U 12E0, 0010,0038,01C0,0920,0000,1024 :2435 Q RC[4]
U 1024, 0001,203D,0180,09D8,0000,111A :2436 =00 CALL,J/RHOM1,RC[0B]_Q ; CHECK GROUP 0 DATA AND HIT AFTER
:2437 ; WRITING GROUP 1
U 1025, 0000,003D,0180,0800,0000,1247 :2438 ERROR1 ; UTRAPPED
U 1026, 0000,003D,0180,0800,0000,1247 :2439 ERROR1 ; HIT MISS BITS INCORRECT.
U 1027, 001D,2000,0180,0800,0010,12E1 :2440 ALU_Q-D,CLK.UBCC
U 12E1, 0000,013C,0180,0800,0000,114E :2441 Z?
U 114E, 0000,003D,0180,0800,0000,1247 :2442 =0 ERROR1 ; DATA INCORRECT
U 114F, 0000,003C,0180,0800,0000,12E2 :2443 NOP
:2444 ;////////////////////
:2445 ;+
:2446 ;[F] WRITE ADDRESS 1B6DB000 WITH DATA AAAAAAAA, THIS WRITE
:2447 ; SHOULD GO INTO GROUP 0 BECAUSE ADDRESS 1B6DB000 IS A HIT THERE.
:2448 ; TEST THE WRITE PULSE GENERATION ON WRITE HIT CYCLES TO GROUP 0.
:2449 ;-
U 12E2, 0810,0038,0180,0928,0200,12E3 :2450 VA RC[5],D_RC[5]
U 12E3, 0001,003C,0180,09F0,0000,12E4 :2451 RC[0E] D
U 12E4, 0810,0038,0180,0900,0000,1028 :2452 D RC[0]
U 1028, 0000,003D,0180,0800,0000,128B :2453 =00 CALL,J/WRITE ; DO A WRITE WHICH IS ALREADY A HIT
:2454 ; IN GROUP 0.
U 1029, 0000,003D,0180,0800,0000,1247 :2455 ERROR1 ; UTRAPPED
U 102A, 0000,003C,0180,0800,0000,12E5 :2456 NOP
:2457 ;
:2458 ;////////////////////
:2459 ;+
:2460 ;[10] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
:2461 ; DATA AAAAAAAA
:2462 ;-
U 12E5, 0010,0038,01C0,0900,0000,102C :2463 Q RC[0]
U 102C, 0001,203D,0180,09D8,0000,111A :2464 =00 CALL,J/RHOM1,RC[0B]_Q ; CHECK THE NEW DATA IN GROUP 0
U 102D, 0000,003D,0180,0800,0000,1247 :2465 ERROR1 ; UTRAPPED
U 102E, 0000,003D,0180,0800,0000,1247 :2466 ERROR1 ; HIT MISS BITS INCORRECT
U 102F, 001D,2000,0180,0800,0010,12E6 :2467 ALU_Q-D,CLK.UBCC
U 12E6, 0000,013C,0180,0800,0000,1150 :2468 Z?
U 1150, 0000,003D,0180,0800,0000,1247 :2469 =0 ERROR1 ; DATA INCORRECT.
:2470 ;////////////////////
:2471 ;+
:2472 ;[11] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1
:2473 ; WITH DATA 66666666
:2474 ;-
U 1151, 0810,0038,0180,0938,0200,12E7 :2475 VA RC[7],D_RC[7]
U 12E7, 0001,003C,0180,09F0,0000,12E8 :2476 RC[0E] D
U 12E8, 0010,0038,01C0,0930,0000,1030 :2477 Q RC[6]
U 1030, 0001,203D,0180,09D8,0000,111C :2478 =00 CALL,J/RHOM1,RC[0B]_Q ; CHECK THE GROUP1 HIT AND DATA
U 1031, 0000,003D,0180,0800,0000,1247 :2479 ERROR1 ; UTRAPPED
U 1032, 0000,003D,0180,0800,0000,1247 :2480 ERROR1 ; HIT MISS BITS INCORRECT
U 1033, 001D,2000,0180,0800,0010,12E9 :2481 ALU_Q-D,CLK.UBCC
U 12E9, 0000,013C,0180,0800,0000,1152 :2482 Z?
U 1152, 0000,003D,0180,0800,0000,1247 :2483 =0 ERROR1 ; DATA INCORRECT
U 1153, 0000,003C,0180,0800,0000,12EA :2484 NOP
:2485 ;////////////////////
:2486 ;+
:2487 ;[12] WRITE ADDRESS 04924000 WITH DATA 55555555, THIS WRITE
:2488 ; SHOULD GO INTO GROUP 1 BECAUSE ADDRESS 04924000 IS A HIT THERE.

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:2489 : TEST THE WRITE PULSE GENERATION ON WRITE HITS IN GROUP 1
:2490 :-
:2491 VA RC[7],D_RC[7]
:2492 RC[OE] D
:2493 D_RC[2]
:2494 =00 CALL J/WRITE
:2495 ERROR1 ; UTRAPPED
:2496 NOP
:2497 =
:2498 :////////////////////
:2499 :+
:2500 : [13] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 WITH
:2501 : DATA 55555555
:2502 :-
:2503 Q RC[2]
:2504 =00 CALL J/RMOM1,RC[OB]_Q ; CHECK HIT AND NEW DATA IN GROUP 1
:2505 ERROR1 ; UTRAPPED
:2506 ERROR1 ; HIT MISS BITS INCORRECT
:2507 ALU_Q-D,CLK.UBCC
:2508 Z?
:2509 =0 ERROR1 ; DATA IN GROUP 1 INCORRECT
:2510 :////////////////////
:2511 :+
:2512 : [14] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
:2513 : DATA AAAAAAAA
:2514 :-
:2515 VA RC[5],D_RC[5]
:2516 RC[OE] D
:2517 Q RC[0]
:2518 =00 CALL J/RMOM1,RC[OB]_Q ; CHECK HIT AND DATA IN GROUP 0
:2519 ERROR1 ; UTRAPPED
:2520 ERROR1 ; HIT MISS BITS INCORRECT
:2521 ALU_Q-D,CLK.UBCC
:2522 Z?
:2523 =0 ERROR1 ; DATA INCORRECT
:2524 NOP
:2525 :////////////////////
:2526 :+
:2527 : [15] CHECK THE FORCE MISS MAINTENANCE BITS IN THE SBI MAINTENANCE
:2528 : REGISTER FOR GROUP 0.
:2529 : SET THE FORCE MISS IN GROUP 0 BIT.
:2530 :-
:2531 U 115A, 0000,003D,0180,0800,0000,129C :2531 =0 CALL J/MOS ; SET FORCE MISS BIT FOR GROUP 0
:2532 :////////////////////
:2533 :+
:2534 : [16] READ ADDRESS 1B6DB000 AND CHECK FOR MISS IN BOTH GROUPS
:2535 :-
:2536 VA RC[5],D_RC[5]
:2537 RC[OE] D
:2538 =00 CALL J7RMOM1 ; SEE IF ADDRESS IS A MISS
:2539 ERROR1 ; UTRAPPED
:2540 ERROR1 ; HIT MISS BITS INCORRECT.
:2541 :////////////////////
:2542 :+
:2543 : [17] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 WITH

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U 12EA, 0810,0038,0180,0938,0200,12EB
U 12EB, 0001,003C,0180,09F0,0000,12EC
U 12EC, 0810,0038,0180,0910,0000,1034
U 1034, 0000,003D,0180,0800,0000,128B
U 1035, 0000,003D,0180,0800,0000,1247
U 1036, 0000,003C,0180,0800,0000,12ED

U 12ED, 0010,0038,01C0,0910,0000,1038
U 1038, 0001,203D,0180,09D8,0000,111C
U 1039, 0000,003D,0180,0800,0000,1247
U 103A, 0000,003D,0180,0800,0000,1247
U 103B, 001D,2000,0180,0800,0010,12EE
U 12EE, 0000,013C,0180,0800,0000,1156
U 1156, 0000,003D,0180,0800,0000,1247

U 1157, 0810,0038,0180,0928,0200,12EF
U 12EF, 0001,003C,0180,09F0,0000,12F0
U 12F0, 0010,0038,01C0,0900,0000,103C
U 103C, 0001,203D,0180,09D8,0000,111A
U 103D, 0000,003D,0180,0800,0000,1247
U 103E, 0000,003D,0180,0800,0000,1247
U 103F, 001D,2000,0180,0800,0010,12F1
U 12F1, 0000,013C,0180,0800,0000,1158
U 1158, 0000,003D,0180,0800,0000,1247
U 1159, 0000,003C,0180,0800,0000,115A

U 115A, 0000,003D,0180,0800,0000,129C

U 115B, 0810,0038,0180,0928,0200,12F2
U 12F2, 0001,003C,0180,09F0,0000,1040
U 1040, 0000,003D,0180,0800,0000,111E
U 1041, 0000,003D,0180,0800,0000,1247
U 1042, 0000,003D,0180,0800,0000,1247


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:2544      DATA 55555555
:2545      :-
U 1043, 0810,0038,0180,0938,0200,12F3 :2546      VA_RC[7],D_RC[7]
U 12F3, 0001,003C,0180,09F0,0000,12F4 :2547      RC[OE]_D
U 12F4, 0010,0038,01C0,0910,0000,1044 :2548      Q_RC[2]
U 1044, 0001,203D,0180,09D8,0000,111C :2549      =00      CALL,J/RMOM1,RC[OB]_Q      : MAKE SURE THE GROUP 0 FORCE MISS
:2550      : BIT AFFECTS GROUP 1
:2551      ERROR1      : UTRAPPED
:2552      ERROR1      : HIT MISS BITS INCORRECT
U 1045, 0000,003D,0180,0800,0000,1247 :2553      ALU_Q-D,CLK.UBCC
U 1046, 0000,003D,0180,0800,0000,1247 :2554      Z?
U 1047, 001D,2000,0180,0800,0010,12F5 :2555      =0      ERROR1      : GROUP 1 DATA INCORRECT.
U 12F5, 0000,013C,0180,0800,0000,115C :2556      NOP
U 115C, 0000,003D,0180,0800,0000,1247 :2557      :////////////////////
U 115D, 0000,003C,0180,0800,0000,115E :2558      :+
:2559      : [18] CLEAR THE GROUP 0 FORCE MISS BIT
:2560      :-
U 115E, 0000,003D,0180,0800,0000,1292 :2561      =0      CALL,J/SOFF      : CLEAR THE FORCE MISS GROUP 0 BIT
:2562      :////////////////////
:2563      :+
:2564      : [19] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
:2565      : DATA AAAAAAAA
:2566      :-
U 115F, 0810,0038,0180,0928,0200,12F6 :2567      VA_RC[5],D_RC[5]
U 12F6, 0001,003C,0180,09F0,0000,12F7 :2568      RC[OE]_D
U 12F7, 0010,0038,01C0,0900,0000,1048 :2569      Q_RC[0]
U 1048, 0001,203D,0180,09D8,0000,111A :2570      =00      CALL,J/RMOM1,RC[OB]_Q      : TEST THE GROUP 0 HIT WITHOUT
:2571      : FORCING MISSES
:2572      ERROR1      : UTRAPPED
:2573      ERROR1      : HIT/MISS BITS INCORRECT
U 1049, 0000,003D,0180,0800,0000,1247 :2574      ALU_Q-D,CLK.UBCC
U 104A, 0000,003D,0180,0800,0000,1247 :2575      Z?
U 104B, 001D,2000,0180,0800,0010,12F8 :2576      =0      ERROR1      : GROUP 0 DATA INCORRECT.
U 12F8, 0000,013C,0180,0800,0000,1160 :2577      NOP
U 1160, 0000,003D,0180,0800,0000,1247 :2578      :////////////////////
U 1161, 0000,003C,0180,0800,0000,1162 :2579      :+
:2580      : [1A] CHECK THE FORCE MISS BIT FOR GROUP 1.
:2581      :-
U 1162, 0000,003D,0180,0800,0000,129E :2582      =0      CALL,J/MIS      : SET THE FORCE MISS BIT FOR GROUP 1
:2583      :////////////////////
:2584      :+
:2585      : [1B] READ ADDRESS 04924000 AND CHECK FOR MISS IN BOTH GROUPS
:2586      :-
U 1163, 0810,0038,0180,0938,0200,12F9 :2587      VA_RC[7],D_RC[7]
U 12F9, 0001,003C,0180,09F0,0000,1050 :2588      RC[OE]_D
U 1050, 0000,003D,0180,0800,0000,111E :2589      =00      CALL,J7RMOM1
U 1051, 0000,003D,0180,0800,0000,1247 :2590      ERROR1      : UTRAPPED
U 1052, 0000,003D,0180,0800,0000,1247 :2591      ERROR1      : HIT/MISS BITS INCORRECT
:2592      :////////////////////
:2593      :+
:2594      : [1C] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0
:2595      : WITH DATA AAAAAAAA
:2596      :-
U 1053, 0810,0038,0180,0928,0200,12FA :2597      VA_RC[5],D_RC[5]
U 12FA, 0001,003C,0180,09F0,0000,12FB :2598      RC[OE]_D

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U 12FB, 0010,0038,01C0,0900,0000,1054 :2599
U 1054, 0001,203D,0180,09D8,0000,111A :2600
U 1055, 0000,003D,0180,0800,0000,1247 :2601
U 1056, 0000,003D,0180,0800,0000,1247 :2602
U 1057, 001D,2000,0180,0800,0010,12FC :2603
U 12FC, 0000,013C,0180,0800,0000,1164 :2604
U 1164, 0000,003D,0180,0800,0000,1247 :2605
U 1165, 0000,003C,0180,0800,0000,1166 :2606
:2607
:2608
:2609
:2610
U 1166, 0000,003D,0180,0800,0000,1292 :2611
:2612
:2613
:2614
:2615
:2616
U 1167, 0810,0038,0180,0938,0200,12FD :2617
U 12FD, 0001,003C,0180,09F0,0000,12FE :2618
U 12FE, 0010,0038,01C0,0910,0000,1060 :2619
U 1060, 0001,203D,0180,09D8,0000,111C :2620
:2621
U 1061, 0000,003D,0180,0800,0000,1247 :2622
U 1062, 0000,003D,0180,0800,0000,1247 :2623
U 1063, 001D,2000,0180,0800,0010,12FF :2624
U 12FF, 0000,013C,0180,0800,0000,1168 :2625
U 1168, 0000,003D,0180,0800,0000,1247 :2626
U 1169, 0000,003C,0180,0800,0000,116A :2627
:2628
:2629
:2630
:2631
:2632
:2633
:2634
:2635
U 116A, 0000,003D,0180,0800,0000,1296 :2636
U 116B, 0000,003C,8580,0800,0084,7300 :2637
U 1300, 0803,001C,0180,0800,0000,1301 :2638
U 1301, 0000,003C,7580,3C00,0000,1302 :2639
:2640
:2641
:2642
:2643
:2644
U 1302, 0010,0038,0180,0908,0200,1303 :2645
U 1303, 0810,0038,0180,0920,0000,1304 :2646
U 1304, 0000,003C,0180,9800,0000,1305 :2647
:2648
:2649
:2650
:2651
:2652
:2653

:2599 Q RC[0]
:2600 CALL,J/RHOM1,RC[0B]_Q ; MAKE SURE GROUP 0 IS NOT AFFECTED.
:2601 ERROR1 ; UTRAPPED
:2602 ERROR1 ; HIT MISS BITS INCORRECT
:2603 ALU_Q-D,CLK.UBCC
:2604 Z?
:2605 =0 ERROR1 ; DATA INCORRECT
:2606 NOP
:2607
:2608
:2609 [1D] CLEAR THE FORCE MISS BIT IN GROUP 1
:2610
:2611 =0 CALL,J/SOFF ; TURN OF THE FORCE MISS BIT.
:2612
:2613
:2614 [1E] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1
:2615 WITH DATA 5555555
:2616
:2617 VA RC[7],D_RC[7]
:2618 RC[0E]_D
:2619 Q RC[2]
:2620 =0 CALL,J/RHOM1,RC[0B]_Q ; CHECK FOR THE GROUP 1 HIT WITHOUT
:2621 ; FORCING MISSES.
:2622 ERROR1 ; UTRAPPED
:2623 ERROR1 ; HIT MISS BITS INCORRECT.
:2624 ALU_Q-D,CLK.UBCC
:2625 Z?
:2626 =0 ERROR1 ; DATA INCORRECT
:2627 NOP
:2628
:2629
:2630 [1F] CHECK THE RANDOM REPLACEMENT OF DATA WRITING FIRST INTO
:2631 GROUP 0 THEN INTO GROUP 1.
:2632 MAKE THE RANDOM FLIP FLIP POINT TO GROUP 0
:2633 BY FIRST SETTING AND THEN CLEARING THE REPLACE
:2634 GROUP 0 BIT IN THE MAINT REGISTER.
:2635
:2636 =0 CALL,J/ROS
:2637 SC K[C]
:2638 ALD NOT,MASK,D_ALU
:2639 ID[MAINT]_D
:2640
:2641
:2642 [20] VALIDATE ADDRESS 19999000 WITH DATA 99999999
:2643 THIS SHOULD BE MADE A HIT IN GROUP 0.
:2644
:2645
:2646 VA RC[1]
:2647 D RC[4]
:2648 FS/MCT,MCT/VALIDATE ; THIS WRITE SHOULD GO INTO
:2649 ; GROUP 0.
:2650
:2651 [21] VALIDATE ADDRESS 06666000 WITH DATA 66666666.
:2652 THIS SHOULD BE MADE A HIT IN GROUP 1.
:2653

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U 1305, 0010,0038,0180,0918,0200,1306 :2654
U 1306, 0810,0038,0180,0930,0000,1307 :2655
U 1307, 0000,003C,0180,9800,0000,1308 :2656
                                           :2657
                                           :2658
                                           :2659
                                           :2660
                                           :2661
                                           :2662
U 1308, 0810,0038,0180,0908,0200,1309 :2663
U 1309, 0001,003C,0180,09F0,0000,130A :2664
U 130A, 0010,0038,01C0,0920,0000,1064 :2665
U 1064, 0001,203D,0180,09D8,0000,111A :2666
U 1065, 0000,003D,0180,0800,0000,1247 :2667
U 1066, 0000,003D,0180,0800,0000,1247 :2668
U 1067, 001D,2000,0180,0800,0010,130B :2669
U 130B, 0000,013C,0180,0800,0000,116C :2670
U 116C, 0000,003D,0180,0800,0000,1247 :2671
                                           :2672
                                           :2673
                                           :2674
                                           :2675
                                           :2676
U 116D, 0810,0038,0180,0918,0200,130C :2677
U 130C, 0001,003C,0180,09F0,0000,130D :2678
U 130D, 0010,0038,01C0,0930,0000,1068 :2679
U 1068, 0001,203D,0180,09D8,0000,111C :2680
                                           :2681
U 1069, 0000,003D,0180,0800,0000,1247 :2682
U 106A, 0000,003D,0180,0800,0000,1247 :2683
U 106B, 001D,2000,0180,0800,0010,130E :2684
U 130E, 0000,013C,0180,0800,0000,116E :2685
U 116E, 0000,003D,0180,0800,0000,1247 :2686
U 116F, 0000,003C,0180,0800,0000,1170 :2687
                                           :2688
                                           :2689
                                           :2690
                                           :2691
                                           :2692
                                           :2693
                                           :2694
U 1170, 0000,003D,0180,0800,0000,129A :2695
U 1171, 0000,003C,8580,0800,0084,730F :2696
U 130F, 0803,001C,0180,0800,0000,1310 :2697
U 1310, 0000,003C,7580,3C00,0000,1311 :2698
                                           :2699
                                           :2700
                                           :2701
                                           :2702
                                           :2703
U 1311, 0010,0038,0180,0928,0200,1312 :2704
U 1312, 0810,0038,0180,0900,0000,1313 :2705
U 1313, 0000,003C,0180,9800,0000,1314 :2706
                                           :2707
                                           :2708

```

```

VA RC[3]
D RC[6]
FS/MCT,MCT/VALIDATE ; THIS WRITE SHOULD GO INTO
                        ; GROUP 1.
////////////////////
+
[22] READ ADDRESS 19999000 AND CHECK FOR HIT IN GROUP 0
WITH DATA 99999999
-
VA RC[1],D_RC[1]
RC[OE]_D
Q RC[4]
=0 CALL,J/RHOM1,RC[OB]_Q ; CHECK THE HIT AT THE FIRST ADDRESS WRITTEN
ERROR1 ; UTRAPPED
ERROR1 ; HIT MISS BITS INCORRECT.
ALU_Q-D,CLK.UBCC
Z?
=0 ERROR1 ; GROUP 0 DATA INCORRECT
////////////////////
+
[23] READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1
WITH DATA 66666666
-
VA RC[3],D_RC[3]
RC[OE]_D
Q RC[6]
=0 CALL,J/RHOM1,RC[OB]_Q ; CHECK FOR A HIT IN GROUP 1 AT THE
                        ; SECOND ADDRESS WRITTEN.
ERROR1 ; UTRAPPED
ERROR1 ; HIT MISS BITS INCORRECT.
ALU_Q-D,CLK.UBCC
Z?
=0 ERROR1 ; GROUP 1 DATA INCORRECT
NOP
////////////////////
+
[24] CHECK RANDOM REPLACEMENT OF DATA WRITING FIRST GROUP 1 THEN GROUP 0.
SET THE RANDOM FF TO POINT TO GROUP 1 BY FIRST SETTING
AND THEN CLEARING THE FORCE REPLACEMENT OF GROUP 1
BIT IN THE MAINT REGISTER.
-
=0 CALL,J/R1S
SC K[C]
ALD NOT,MASK,D_ALU
ID[MAINT]_D
////////////////////
+
[25] VALIDATE ADDRESS 1B6DB000 WITH DATA AAAAAAAA
THIS SHOULD BE MADE A HIT IN GROUP 1.
-
VA RC[5]
D RC[0]
FS/MCT,MCT/VALIDATE ; SHOULD BE WRITTEN INTO GROUP 1
////////////////////
+

```



```

:2709 ; [26] VALIDATE ADDRESS 04924000 WITH DATA 55555555
:2710 ; THIS SHOULD BE MADE A HIT IN GROUP 0
:2711 ; -
:2712 VA_RC[7]
:2713 D_RC[2]
:2714 FS/MCT,MCT/VALIDATE
:2715 ; //////////////////////////////////////
:2716 ; +
:2717 ; [27] READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 1
:2718 ; WITH DATA AAAAAAAA.
:2719 ; -
:2720 VA_RC[5],D_RC[5]
:2721 RC[OE]_D
:2722 Q_RC[0]
:2723 =00 CALL,J/RM0H1,RC[OB]_Q ; CHECK THE HIT IN GROUP ONE AT THE
:2724 ; FIRST ADDRESS WRITTEN.
:2725 ERROR1 ; UTRAPPED
:2726 ERROR1 ; HIT MISS BITS INCORRECT.
:2727 ALU_Q-D,CLK.UBCC
:2728 Z?
:2729 =0 ERROR1 ; GROUP 1 DATA INCORRECT.
:2730 ; //////////////////////////////////////
:2731 ; +
:2732 ; [28] READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 0
:2733 ; WITH DATA 55555555.
:2734 ; -
:2735 VA_RC[7],D_RC[7]
:2736 RC[OE]_D
:2737 Q_RC[2]
:2738 =00 CALL,J/RH0M1,RC[OB]_Q ; UTRAPPED
:2739 ERROR1 ; HIT MISS BIT INCORRECT
:2740 ERROR1
:2741 ALU_Q-D,CLK.UBCC
:2742 Z?
:2743 =0 ERROR1 ; GROUP 0 DATA INCORRECT.
:2744 NOP

```

U 1314, 0010,0038,0180,0938,0200,1315
U 1315, 0810,0038,0180,0910,0000,1316
U 1316, 0000,003C,0180,9800,0000,1317

U 1317, 0810,0038,0180,0928,0200,1318
U 1318, 0001,003C,0180,09F0,0000,1319
U 1319, 0010,0038,01C0,0900,0000,106C
U 106C, 0001,203D,0180,09D8,0000,111C

U 106D, 0000,003D,0180,0800,0000,1247
U 106E, 0000,003D,0180,0800,0000,1247
U 106F, 001D,2000,0180,0800,0010,131A
U 131A, 0000,013C,0180,0800,0000,1172
U 1172, 0000,003D,0180,0800,0000,1247

U 1173, 0810,0038,0180,0938,0200,131B
U 131B, 0001,003C,0180,09F0,0000,131C
U 131C, 0010,0038,01C0,0910,0000,1070
U 1070, 0001,203D,0180,09D8,0000,111A
U 1071, 0000,003D,0180,0800,0000,1247
U 1072, 0000,003D,0180,0800,0000,1247
U 1073, 001D,2000,0180,0800,0010,131D
U 131D, 0000,013C,0180,0800,0000,1174
U 1174, 0000,003D,0180,0800,0000,1247
U 1175, 0000,003C,0180,0800,0000,1176


```

:2745 .PAGE      'TEST CF      ADDRESS BIT 2 IN GROUP 0 TEST'
:2746 *****
:2747 **
:2748 TEST CF      ADDRESS BIT 2 IN GROUP 0 TEST
:2749
:2750 TEST DESCRIPTION
:2751     THIS IS A TEST OF ADDRESS BIT 2 IN GROUP 0.
:2752
:2753 LOGIC DESCRIPTION
:2754     TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2755     PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2756     THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2757     TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2758     CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2759     IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2760     IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2761     ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2762     REGISTER ON THE SBI CONTROL MODULE.
:2763
:2764 ERROR DESCRIPTION
:2765     VA REFERENCED
:2766     EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2767         ONLY HIT/MISS AND FORCE MISS AND FORCE REPLACE
:2768         BITS ARE RELEVANT)
:2769         OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2770         UTRAP OCCURS
:2771     GOT CACHE MAINT REGISTER
:2772     EXPECTED READ DATA
:2773     GOT READ DATA
:2774     UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2775         FLAG      UTRAP TYPE
:2776         ----      -
:2777         1DE      NO UTRAP OCCURRED
:2778         DE      CACHE PARITY UTRAP
:2779         15E      TB PARITY ERROR
:2780         19E      TB MISS
:2781         1CE      TB PROTECTION ERROR
:2782         1D6      TB MODIFY BIT ERROR
:2783         1DA      X PAGE UTRAP
:2784         1DC      UNALIGNED DATA UTRAP

```

```

:2786 :--
:2787 :*****
:2788 :0
:2789 :ADR2G0: NEWTST
:2790 :D 0,RC[0F] K[.6]
:2791 :0 ID[TBERO]_D,CALL,J/CAPAT ; TURN OFF TB AND GENERATE TEST DATA PATTERNS
:2792 :D 0
:2793 :0 CALL,J/DC.1DE ; SET UP UTRAP FLAG
:2794 :RC[OE] D
:2795 :0 CALL,J/SOFF ; TURN OFF SBI CYCLES.
:2796 :VA K[ZERO] ; INVALIDATE LOCATION 0 OF BOTH GROUPS
:2797 :FS7MCT,MCT/INVALIDATE
:2798 :VA K[.4] ; INVALIDATE LOCATION 4 OF BOTH GROUPS
:2799 :FS7MCT,MCT/INVALIDATE

```

U	1176.	0000	003D	0180	0800	0000	1233
U	1177.	0F18	0038	D580	09F8	0000	1178
U	1178.	0000	003D	4980	3C00	0000	12A7
U	1179.	0F00	003C	0180	0800	0000	117A
U	117A.	0000	003D	0180	0800	0000	1250
U	117B.	0001	003C	0180	0AF0	0000	117C
U	117C.	0000	003D	0180	0800	0000	1292
U	117D.	0018	0038	1980	0800	0200	131E
U	131E.	0000	003C	0180	9000	0000	131F
U	131F.	0018	0038	1180	0800	0200	1320
U	1320.	0000	003C	0180	9000	0000	117E

—————

U 117E.	0000,003D,0180,0800,0000,1296	:2800	=0	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 117F.	0010,0038,0180,0908,0200,1321	:2801		VA RC[1]	: VA=19999000
U 1321.	0810,0038,0180,0900,0000,1322	:2802		D RC[0]	: DATA=AAAAAAAA
U 1322.	0000,003C,0180,9800,0000,1180	:2803		FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 1180.	0000,003D,0180,0800,0000,129A	:2804	=0	CALL,J/RIS	: SET FORCE REPLACE GROUP 1 BIT
U 1181.	0010,0038,0180,0918,0200,1323	:2805		VA RC[3]	: VA=06666000
U 1323.	0810,0038,0180,0910,0000,1324	:2806		D RC[2]	: DATA=55555555
U 1324.	0000,003C,0180,9800,0000,1182	:2807		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 1182.	0000,003D,0180,0800,0000,1292	:2808	=0	CALL,J/SOFF	: TURN OFF FORCE REPLACE BITS
U 1183.	0810,0038,0180,0908,0200,1325	:2809		VA RC[1],D RC[1]	: WRITE DATA=99999999
U 1325.	0019,0014,1180,09F3,0000,1326	:2810		VA-VA+4,ALU_D[A+B]K[.4],RC[OE] ALU	: AT ADDRESS 19999004.
U 1326.	0810,0038,0180,0920,0000,1074	:2811		D RC[4]	: VA=1999004 IS A HIT IN 0
U 1074.	0000,003D,0180,0800,0000,128B	:2812	=00	CALL,J/WRITE	
U 1075.	0000,003D,0180,0800,0000,1247	:2813		ERROR1	: UTRAPPED
U 1076.	0810,0038,0180,0908,0200,1077	:2814		VA RC[1],D RC[1]	: CHECK GROUP 0 HIT AT 19999000
U 1077.	0001,003C,0180,09F0,0000,1327	:2815		RC[OE] D	
U 1327.	0010,0038,01C0,0900,0000,1078	:2816		Q RC[0]	
U 1078.	0001,203D,0180,09D8,0000,111A	:2817	=00	CALL,J/RHOM1,RC[OB]_Q	
U 1079.	0000,003D,0180,0800,0000,1247	:2818		ERROR1	: A UTRAP OCCURRED.
U 107A.	0000,003D,0180,0800,0000,1247	:2819		ERROR1	: HIT/MISS BITS INCORRECT.
U 107B.	001D,2000,0180,0800,0010,1328	:2820		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 19999000, =AAAAAAAA
U 1328.	0000,013C,0180,0800,0000,1184	:2821		Z?	
U 1184.	0000,003D,0180,0800,0000,1247	:2822	=0	ERROR1	: GROUP ZERO DATA AT
		:2823			: ADDRESS VA<2>=0 INCORRECT
U 1185.	0810,0038,0180,0908,0000,1329	:2824		VA VA+4,D RC[1]	: CHECK GROUP 0 HIT AT 19999004
U 1329.	0019,0014,1180,09F0,0000,132A	:2825		ALU_D[A+B]K[.4],RC[OE]_ALU	
U 132A.	0010,0038,01C0,0920,0000,107C	:2826		Q RC[4]	
U 107C.	0001,203D,0180,09D8,0000,111A	:2827	=00	CALL,J/RHOM1,RC[OB]_Q	
U 107D.	0000,003D,0180,0800,0000,1247	:2828		ERROR1	: AN UNEXPECTED UTRAP OCCURRED.
U 107E.	0000,003D,0180,0800,0000,1247	:2829		ERROR1	: HIT/MISS BITS INCORRECT
U 107F.	001D,2000,0180,0800,0010,132B	:2830		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 19999004, =99999999
U 132B.	0000,013C,0180,0800,0000,1186	:2831		Z?	
U 1186.	0000,003D,0180,0800,0000,1247	:2832	=0	ERROR1	: GROUP ZERO DATA AT
		:2833			: ADDRESS VA<2>=1 INCORRECT
U 1187.	0810,0038,0180,0918,0200,132C	:2834		VA RC[3],D RC[3]	: CHECK GROUP 1 HIT AT 06666000
U 132C.	0001,003C,0180,09F0,0000,132D	:2835		RC[OE] D	
U 132D.	0010,0038,01C0,0910,0000,1080	:2836		Q RC[2]	
U 1080.	0001,203D,0180,09D8,0000,111C	:2837	=00	CALL,J/RHOM1,RC[OB]_Q	
U 1081.	0000,003D,0180,0800,0000,1247	:2838		ERROR1	: AN UNEXPECTED UTRAP OCCURRED
U 1082.	0000,003D,0180,0800,0000,1247	:2839		ERROR1	: HIT/MISS BITS INCORRECT.
U 1083.	001D,2000,0180,0800,0010,132E	:2840		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 06666000, =55555555
U 132E.	0000,013C,0180,0800,0000,1188	:2841		Z?	
U 1188.	0000,003D,0180,0800,0000,1247	:2842	=0	ERROR1	
U 1189.	0000,003C,0180,0800,0000,118A	:2843		NOP	

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:2844 .PAGE "TEST DO ADDRESS BIT 2 IN GROUP 1 TEST"
:2845 .....
:2846 **
:2847 TEST DO ADDRESS BIT 2 IN GROUP 1 TEST
:2848
:2849 TEST DESCRIPTION
:2850 THIS IS A TEST OF ADDRESS BIT 2 IN GROUP 1.
:2851
:2852 LOGIC DESCRIPTION
:2853 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2854 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2855 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2856 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2857 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2858 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2859 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2860 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2861 REGISTER ON THE SBI CONTROL MODULE.
:2862
:2863 ERROR DESCRIPTION
:2864 VA REFERENCED
:2865 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2866 ONLY HIT/MISS, FORCE MISS AND FORCE REPLACE
:2867 BITS ARE RELEVANT)
:2868 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2869 UTRAP OCCURS
:2870 GOT CACHE MAINT REGISTER
:2871 EXPECTED READ DATA
:2872 GOT READ DATA
:2873 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2874 FLAG UTRAP TYPE
:2875 ----
:2876 1DE NO UTRAP OCCURRED
:2877 DE CACHE PARITY UTRAP
:2878 15E TB PARITY ERROR
:2879 19E TB MISS
:2880 1CE TB PROTECTION ERROR
:2881 1D6 TB MODIFY BIT ERROR
:2882 1DA X PAGE UTRAP
:2883 1DC UNALIGNED DATA UTRAP
:2884
:2885
:2886
:2887
:2888
:2889
:2890
:2891
:2892
:2893
:2894
:2895
:2896
:2897
:2898
    
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U 118A, 0000,003D,0180,0800,0000,1233
U 118B, 0F18,0038,D580,09F8,0000,118C
U 118C, 0000,003D,4980,3C00,0000,12A7
U 118D, 0F00,003C,0180,0800,0000,118E
U 118E, 0000,003D,0180,0800,0000,1250
U 118F, 0001,003C,0180,0AF0,0000,1190
U 1190, 0000,003D,0180,0800,0000,1292
U 1191, 0018,0038,1980,0800,0200,132F
U 132F, 0000,003C,0180,9000,0000,1330
U 1330, 0018,0038,1180,0800,0200,1331
U 1331, 0000,003C,0180,9000,0000,1192

=0 ADR2G1: NEWTST
      D 0,RC[0F],K[.6]
      ID[1BER0],D,CALL,J/CAPAT : TURN OFF THE TB AND GENERATE TEST DATA PATTERNS
      D 0
      CALL,J/DC.1DE : SET UP UTRAP FLAG
      R[OE],D
      CALL,J/SOFF : TURN OFF SBI CYCLES
      VA K[ZERO] : INVALIDATE LOCATION 0 OF BOTH GROUPS
      FS7MCT,MCT/INVALIDATE
      VA K[.4]
      FS7MCT,MCT/INVALIDATE : INVALIDATE LOCATION 4 OF BOTH GROUPS
    
```


U 1192.	0000,003D,0180,0800,0000,129A	:2899	=0	CALL,J/R15	: FORCE REPLACE GROUP 1
U 1193.	0010,0038,0180,0908,0200,1332	:2900		VA RC[1]	: VA=19999000
U 1332.	0810,0038,0180,0900,0000,1333	:2901		D RC[0]	: DATA=AAAAAAAA
U 1333.	0000,003C,0180,9800,0000,1194	:2902		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 1194.	0000,003D,0180,0800,0000,1296	:2903	=0	CALL,J/ROS	: FORCE REPLACE GROUP 0
U 1195.	0010,0038,0180,0918,0200,1334	:2904		VA RC[3]	: VA=06666000
U 1334.	0810,0038,0180,0910,0000,1335	:2905		D RC[2]	: DATA=55555555
U 1335.	0000,003C,0180,9800,0000,1196	:2906		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 1196.	0000,003D,0180,0800,0000,1292	:2907	=0	CALL,J/SOFF	: TURN OFF FORCE REPLACE BIT
U 1197.	0810,0038,0180,0908,0200,1336	:2908		VA RC[1],D RC[1]	: WRITE DATA=99999999
U 1336.	0019,0014,1180,09F3,0000,1337	:2909		VA-VA+4,ALU_D[A+B]K[.4],RC[0E] ALU	: AT ADDRESS 19999004
U 1337.	0810,0038,0180,0920,0000,1084	:2910		D RC[4]	: 19999004 IS A HIT IN GROUP 1
U 1084.	0000,003D,0180,0800,0000,128B	:2911	=00	CALL,J/WRITE	
U 1085.	0000,003D,0180,0800,0000,1247	:2912		ERROR1	: UTRAPPED
U 1086.	0810,0038,0180,0908,0200,1087	:2913		VA RC[1],D RC[1]	: CHECK GROUP 0 HIT AT 19999000
U 1087.	0001,003C,0180,09F0,0000,1338	:2914		RC[0E] D	
U 1338.	0010,0038,01C0,0900,0000,1088	:2915		Q RC[0]	
U 1088.	0001,203D,0180,09D8,0000,111C	:2916	=00	CALL,J/RMOH1,RC[0B]_Q	
U 1089.	0000,003D,0180,0800,0000,1247	:2917		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 108A.	0000,003D,0180,0800,0000,1247	:2918		ERROR1	: HIT/MISS BITS INCORRECT
U 108B.	001D,2000,0180,0800,0010,1339	:2919		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 19999000, =AAAAAAAA
U 1339.	0000,013C,0180,0800,0000,1198	:2920		Z?	
U 1198.	0000,003D,0180,0800,0000,1247	:2921	=0	ERROR1	: GROUP ONE DATA AT
		:2922			: ADDRESS VA<2>=0 INCORRECT
U 1199.	0810,0038,0180,0908,0000,133A	:2923		VA VA+4,D RC[1] ; CHECK GROUP 1 HIT AT 19999004	
U 133A.	0019,0014,1180,09F0,0000,133B	:2924		ALU_D[A+B]K[.4],RC[0E]_ALU	
U 133B.	0010,0038,01C0,0920,0000,108C	:2925		Q RC[4]	
U 108C.	0001,203D,0180,09D8,0000,111C	:2926	=00	CALL,J/RMOH1,RC[0B]_Q	
U 108D.	0000,003D,0180,0800,0000,1247	:2927		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 108E.	0000,003D,0180,0800,0000,1247	:2928		ERROR1	: HIT/MISS BITS INCORRECT
U 108F.	001D,2000,0180,0800,0010,133C	:2929		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 19999004, =99999999
U 133C.	0000,013C,0180,0800,0000,119A	:2930		Z?	
U 119A.	0000,003D,0180,0800,0000,1247	:2931	=0	ERROR1	: GROUP ONE DATA AT
		:2932			: ADDRESS VA<2>=1 INCORRECT
U 119B.	0810,0038,0180,0918,0200,133D	:2933		VA RC[3],D RC[3]	: CHECK GROUP 0 HIT AT 06666000
U 133D.	0001,003C,0180,09F0,0000,133E	:2934		RC[0E] D	
U 133E.	0010,0038,01C0,0910,0000,1090	:2935		Q RC[2]	
U 1090.	0001,203D,0180,09D8,0000,111A	:2936	=00	CALL,J/RMOH1,RC[0B]_Q	
U 1091.	0000,003D,0180,0800,0000,1247	:2937		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 1092.	0000,003D,0180,0800,0000,1247	:2938		ERROR1	: HIT/MISS BITS INCORRECT
U 1093.	001D,2000,0180,0800,0010,133F	:2939		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 06666000, =55555555
U 133F.	0000,013C,0180,0800,0000,119C	:2940		Z?	
U 119C.	0000,003D,0180,0800,0000,1247	:2941	=0	ERROR1	
U 119D.	0000,003C,0180,0800,0000,119E	:2942		NOP	


```

:2943 .PAGE "TEST D1 DATA PATH TO GROUP 0 TEST"
:2944 *****
:2945 ++
:2946 TEST D1 DATA PATH TO GROUP 0 TEST
:2947
:2948 TEST DESCRIPTION
:2949 THIS IS A TEST OF DATA LOCATION 0 (PA<11:02>=0) IN THE DATA
:2950 MEMORY OF GROUP ZERO. A ONE IS FLOATED THROUGH A FIELD OF ZEROES AND A ZERO
:2951 IS FLOATED THROUGH A FIELD OF ONES TO GENERATE THE
:2952 TEST DATA PATTERNS.
:2953
:2954 LOGIC DESCRIPTION
:2955 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2956 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2957 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2958 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2959 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2960 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2961 IF THE APPROPRIATE HIT SIGNAL IS INCCRECT FROM THAT MODULE;
:2962 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2963 REGISTER ON THE SBI CONTROL MODULE.
:2964
:2965 ERROR DESCRIPTION
:2966 VA REFERENCED
:2967 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2968 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
:2969 BITS ARE RELEVANT)
:2970 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2971 UTRAP OCCURS
:2972 GOT CACHE MAINT REGISTER
:2973 EXPECTED READ DATA
:2974 GOT READ DATA
:2975 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2976 FLAG UTRAP TYPE
:2977 ----
:2978 1DE NO UTRAP OCCURRED
:2979 DE CACHE PARITY UTRAP
:2980 15E TB PARITY ERROR
:2981 19E TB MISS
:2982 1CE TB PROTECTION ERROR
:2983 1D6 TB MODIFY BIT ERROR
:2984 1DA X PAGE UTRAP
:2985 1DC UNALIGNED DATA UTRAP
:2986
:2987 --
:2988 *****
:2989 =0
:2990 DATGO: NEWTST
:2991 D 0,RC[OF] K[.6]
:2992 =0 CALL J/DC.TDE ; SET UP UTRAP FLAG.
:2993 RC[OE]_D
:2994 D 0
:2995 =0 ID[TERO] D,CALL,J/CAPAT ; TURN TB OFF AND GET TEST PATTERNS
:2996 VA K[ZERO] ; INVALIDATE LOCATION 0 IN BOTH GROUPS.
:2997 FS7MCT,MCT/INVALIDATE

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U 119E, 0000,003D,0180,0800,0000,1233
U 119F, 0F18,0038,D580,09F8,0000,11A0
U 11A0, 0000,003D,0180,0800,0000,1250
U 11A1, 0001,003C,0180,0AF0,0000,1340
U 1340, 0F00,003C,0180,0800,0000,11A2
U 11A2, 0000,003D,4980,3C00,0000,12A7
U 11A3, 0018,0038,1980,0800,0200,1341
U 1341, 0000,003C,0180,9000,0000,11A4

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U 11A4,	0000,003D,0180,0800,0000,1296	:2998	=0	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 11A5,	0010,0038,0180,0908,0200,1342	:2999		VA RC[1]	: VA=19999000
U 1342,	0810,0038,0180,0900,0000,1343	:3000		D RC[0]	: DATA=AAAAAAAA
U 1343,	0000,003C,0180,9800,0000,11A6	:3001		FS/MCT,MCT/VALIDATE	: WRITE GROUP 0.
U 11A6,	0000,003D,0180,0800,0000,129A	:3002	=0	CALL,J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 11A7,	0010,0038,0180,0918,0200,1344	:3003		VA RC[3]	: VA=06666000
U 1344,	0810,0038,0180,0910,0000,1345	:3004		D RC[2]	: DATA=55555555
U 1345,	0000,003C,0180,9800,0000,11A8	:3005		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1.
U 11A8,	0000,003D,0180,0800,0000,1292	:3006	=0	CALL,J/SOFF	: CLEAR FORCE REPLACE BITS.
U 11A9,	0018,0038,8D80,0A80,0000,11AA	:3007		RC[0] KC.1F]	: SET UP THE TEST DATA COUNTER.
U 11AA,	0000,003D,0180,0800,0000,1246	:3008	=0	ERLOOP	
U 11AB,	0000,003C,0180,0A00,0082,1346	:3009		DATGOA: SC_RC[0]	: USE THE MASK TO GENERATE THE
		:3010			: TEST DATA, 1 IN 0'S
U 1346,	0810,0038,0180,0908,0200,1347	:3011		VA RC[1],D_RC[1]	: VA=19999000, WHICH IS A HIT IN 0
U 1347,	0001,003C,0180,09F0,0000,1348	:3012		RC[0E] D	
U 1348,	0803,001C,0180,09D8,0000,1094	:3013		ALU NOT MASK,RC[0B]_ALU,D_ALU	
U 1094,	0000,003D,0180,0800,0000,128B	:3014	=00	CALC,J/WRITE	: WRITE GROUP 0.
U 1095,	0000,003D,0180,0800,0000,1247	:3015		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 1096,	081B,0000,0580,0800,0000,1098	:3016		ALU_0-KC.1],D_ALU	
		:3017	=		
U 1098,	0000,003D,0180,0800,0000,111A	:3018	=00	CALL,J/RHOM1	: CHECK GROUP 0 HIT AT 19999000
U 1099,	0000,003D,0180,0800,0000,1247	:3019		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 109A,	0000,003D,0180,0800,0000,1247	:3020		ERROR1	: HIT/MISS BITS INCORRECT
U 109B,	0010,0038,01C0,0958,0000,1349	:3021		Q RC[0B]	: CHECK DATA AT 19999000, 1 IN 0'S.
U 1349,	001D,2000,0180,0800,0010,134A	:3022		ALU_Q-D,CLK.UBCC	
U 134A,	0000,013C,0180,0800,0000,11AC	:3023		Z?	
U 11AC,	0000,003D,0180,0800,0000,1247	:3024	=0	ERROR1	: DATA AT 19999000 INCORRECT
U 11AD,	0000,003C,0180,0A00,0082,134B	:3025		SC_RC[0]	: USE THE MASK TO GENERATE THE TEST
		:3026			: DATA, A 0 IN 1'S.
U 134B,	0810,0038,0180,0908,0200,134C	:3027		VA RC[1],D_RC[1]	: VA=19999000
U 134C,	0001,003C,0180,09F0,0000,134D	:3028		RC[0E] D	
U 134D,	0800,0038,0180,09D8,0000,109C	:3029		ALU MASK,RC[0B]_ALU,D_ALU	
U 109C,	0000,003D,0180,0800,0000,128B	:3030	=00	CALC,J/WRITE	: WRITE GROUP 0
U 109D,	0000,003D,0180,0800,0000,1247	:3031		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 109E,	0F00,003C,0180,0800,0000,10A0	:3032		D_0	
		:3033	=		
U 10A0,	0000,003D,0180,0800,0000,111A	:3034	=00	CALL,J/RHOM1	: CHECK GROUP 0 HIT AT 19999000
U 10A1,	0000,003D,0180,0800,0000,1247	:3035		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 10A2,	0000,003D,0180,0800,0000,1247	:3036		ERROR1	: HIT/MISS BITS INCORRECT
U 10A3,	0010,0038,01C0,0958,0000,134E	:3037		Q RC[0B]	: CHECK DATA AT 19999000, =0 IN 1'S
U 134E,	001D,2000,0180,0800,0010,134F	:3038		ALU_Q-D,CLK.UBCC	
U 134F,	0000,013C,0180,0800,0000,11AE	:3039		Z?	
U 11AE,	0000,003D,0180,0800,0000,1247	:3040	=0	ERROR1	: DATA INCORRECT AT 19999000
U 11AF,	0000,003C,0180,0A00,0010,1350	:3041		ALU_RC[0],CLK.UBCC	: TRIED ALL TEST PATTERNS?
U 1350,	0000,013C,0180,0800,0000,11B0	:3042		Z?	
U 11B0,	0018,0000,0580,0A80,0000,11AB	:3043	=0	RC[0] LA-KC.1],J/DATGOA	: IF NOT CONTINUE.
U 11B1,	0810,0038,0180,0918,0200,1351	:3044		VA RC[3],D_RC[3]	: CHECK GROUP 1 HIT AT 06666000
U 1351,	0001,003C,0180,09F0,0000,1352	:3045		RC[0E] D	
U 1352,	0010,0038,01C0,0910,0000,10A4	:3046		Q RC[2]	
U 10A4,	0001,203D,0180,09D8,0000,111C	:3047	=00	CALL,J/RHOM1,RC[0B]_Q	
U 10A5,	0000,003D,0180,0800,0000,1247	:3048		ERROR1	: UNEXPECTED UTRAP OCCURRED.
U 10A6,	0000,003D,0180,0800,0000,1247	:3049		ERROR1	: HIT/MISS BITS INCORRECT
U 10A7,	001D,2000,0180,0800,0010,1353	:3050		ALU_Q-D,CLK.UBCC	: CHECK DATA AT 06666000, =55555555
U 1353,	0000,013C,0180,0800,0000,11B2	:3051		Z?	
U 11B2,	0000,003D,0180,0800,0000,1247	:3052	=0	ERROR1	

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U 11B3, 0000,003C,0180,0800,0000,11B4 ;3053 NOP

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3054 .PAGE "TEST D2 DATA PATH TO GROUP 1 TEST"
3055 *****
3056 ++
3057 TEST D2 DATA PATH TO GROUP 1 TEST
3058
3059 TEST DESCRIPTION
3060 THIS IS A TEST OF LOCATION ZERO (PA<11:3>=0) IN
3061 GROUP ONE. A ONE IS FLOATED THROUGH A FIELD OF ZEROES
3062 AND A ZERO IS FLOATED THROUGH A FIELD OF ONES TO GENERATE
3063 THE TEST DATA PATTERNS.
3064
3065 LOGIC DESCRIPTION
3066 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
3067 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
3068 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
3069 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
3070 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
3071 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
3072 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
3073 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
3074 REGISTER ON THE SBI CONTROL MODULE.
3075
3076 ERROR DESCRIPTION
3077 VA REFERENCED
3078 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
3079 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
3080 BITS ARE RELEVANT)
3081 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
3082 UTRAP OCCURS
3083 GOT CACHE MAINT REGISTER
3084 EXPECTED READ DATA
3085 GOT READ DATA
3086 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
3087 FLAG UTRAP TYPE
3088 ----
3089 1DE NO UTRAP OCCURRED
3090 DE CACHE PARITY UTRAP
3091 15E TB PARITY ERROR
3092 19E TB MISS
3093 1CE TB PROTECTION ERROR
3094 1D6 TB MODIFY BIT ERROR
3095 1DA X PAGE UTRAP
3096 1DC UNALIGNED DATA UTRAP
3097
3098 --
3099 *****
3100 =0
3101 DATG1: NEWTST
3102 D 0,RC[OF] K[.6]
3103 =0 CALL J/DC.TDE ; SET THE UTRAP FLAG
3104 RC[OE]_D
3105 D G
3106 =0 ID[TERO] D,CALL,J/CAPAT ; TURN OFF TB AND GET TEST PATTERNS
3107 VA K[ZERO] ; INVALIDATE LOCATION 0 IN BOTH GROUPS.
3108 FS7MCT,MCT/INVALIDATE

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U 11B4, 0000,003D,0180,0800,0000,1233
U 11B5, 0F18,0038,D580,09F8,0000,11B6
U 11B6, 0000,003D,0180,0800,0000,1250
U 11B7, 0001,003C,0180,0AF0,0000,1354
U 1354, 0F00,003C,0180,0800,0000,11B8
U 11B8, 0000,003D,4980,3C00,0000,12A7
U 11B9, 0018,0038,1980,0800,0200,1355
U 1355, 0000,003C,0180,9000,0000,11BA

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U 11BA, 0000,003D,0180,0800,0000,1296 :3109 =0 CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
U 11BB, 0010,0038,0180,0928,0200,1356 :3110 VA RC[5] ; VA=1B6DB000
U 1356, 0810,0038,0180,0920,0000,1357 :3111 D RC[4] ; DATA=99999999
U 1357, 0000,003C,0180,9800,0000,11BC :3112 FS/MCT,MCT/VALIDATE ; WRITE GROUP 0.
U 11BC, 0000,003D,0180,0800,0000,129A :3113 =0 CALL,J/R1S ; SET FORCE REPLACE GROUP 1 BIT.
U 11BD, 0010,0038,0180,0938,0200,1358 :3114 VA RC[7] ; VA=4924000
U 1358, 0810,0038,0180,0930,0000,1359 :3115 D RC[6] ; DATA=66666666
U 1359, 0000,003C,0180,9800,0000,11BE :3116 FS/MCT,MCT/VALIDATE ; WRITE GROUP 1
U 11BE, 0000,003D,0180,0800,0000,1292 :3117 =0 CALL,J/SOFF ; CLEAR FORCE REPLACE BITS.
U 11BF, 0018,0038,8080,0A80,0000,11C0 :3118 R[0] KC.1F] ; INIATILZE A COUNTER.
U 11C0, 0000,003D,0180,0800,0000,1246 :3119 =0 ERLOOP
U 11C1, 0000,003C,0180,0A00,0082,135A :3120 DATG1A: SC_R[0] ; USE THE MASK TO GENERATE
:3121 ; THE TEST DATA, =1 IN 0'S.
U 135A, 0810,0038,0180,0938,0200,135B :3122 VA RC[7],D_RC[7] ; VA=04924000, A HIT IN GROUP 1.
U 135B, 0001,003C,0180,09F0,0000,135C :3123 RC[0E] D
U 135C, 0803,001C,0180,09D8,0000,10A8 :3124 ALU NOT.MASK,RC[0B],ALU,D_ALU
U 10A8, 0000,003D,0180,0800,0000,128B :3125 =00 CALL,J/WRITE ; WRITE TEST DATA.
U 10A9, 0000,003D,0180,0800,0000,1247 :3126 ERROR1 ; UNEXPECTED UTRAP OCCURRED.
U 10AA, 081B,0000,0580,0800,0000,10AC :3127 ALU_0-KC.1],D_ALU
:3128 =
U 10AC, 0000,003D,0180,0800,0000,111C :3129 =00 CALL,J/RM0H1 ; CHECK GROUP 1 HIT AT 04924000
U 10AD, 0000,003D,0180,0800,0000,1247 :3130 ERROR1 ; UNEXPECTED UTRAP OCCURRED.
U 10AE, 0000,003D,0180,0800,0000,1247 :3131 ERROR1 ; HIT/MISS BITS INCORRECT
U 10AF, 0010,0038,01C0,0958,0000,135D :3132 Q RC[0B] ; CHECK DATA AT 04924000, = 1 IN 0'S
U 135D, 001D,2000,0180,0800,0010,135E :3133 ALU_Q-D,CLK.UBCC
U 135E, 0000,013C,0180,0800,0000,11C2 :3134 Z?
U 11C2, 0000,003D,0180,0800,0000,1247 :3135 =0 ERROR1 ; DATA AT 04924000 INCORRECT.
U 11C3, 0000,003C,0180,0A00,0082,135F :3136 SC_R[0] ; USE THE MASK TO GENERATE THE TEST
:3137 ; DATA PATTERN, = 0 IN 1'S
U 135F, 0810,0038,0180,0938,0200,1360 :3138 VA RC[7],D_RC[7] ; VA=04924000
U 1360, 0001,003C,0180,09F0,0000,1361 :3139 RC[0E] D
U 1361, 0800,0038,0180,09D8,0000,10B0 :3140 ALU MASK,RC[0B],ALU,D_ALU
U 10B0, 0000,003D,0180,0800,0000,128B :3141 =00 CALL,J/WRITE ; WRITE GROUP 1
U 10B1, 0000,003D,0180,0800,0000,1247 :3142 ERROR1 ; UNEXPECTED UTRAP OCCURRED.
U 10B2, 0F00,003C,0180,0800,0000,10B4 :3143 D_0
:3144 =
U 10B4, 0000,003D,0180,0800,0000,111C :3145 =00 CALL,J/RM0H1 ; CHECK THE GROUP 1 HIT AT 04924000
U 10B5, 0000,003D,0180,0800,0000,1247 :3146 ERROR1 ; UNEXPECTED UTRAP OCCURRED.
U 10B6, 0000,003D,0180,0800,0000,1247 :3147 ERROR1 ; HIT/MISS BITS INCORRECT
U 10B7, 0010,0038,01C0,0958,0000,1362 :3148 Q RC[0B] ; CHECK THE DATA AT 04924, = 0 IN 1'S
U 1362, 001D,2000,0180,0800,0010,1363 :3149 ALU_Q-D,CLK.UBCC
U 1363, 0000,013C,0180,0800,0000,11C4 :3150 Z?
U 11C4, 0000,003D,0180,0800,0000,1247 :3151 =0 ERROR1 ; DATA AT 04924000 INCORRECT.
U 11C5, 0000,003C,0180,0A00,0010,1364 :3152 ALU_R[0],CLK.UBCC ; TRIED ALL TEST PATTERNS?
U 1364, 0000,013C,0180,0800,0000,11C6 :3153 Z?
U 11C6, 0018,0000,0580,0A80,0000,11C1 :3154 =0 R[0] LA-KC.1],J/DATG1A ; IF NOT CONTINUE
U 11C7, 0810,0038,0180,0928,0200,1365 :3155 VA RC[5],D_RC[5] ; VA=1B6DB000
U 1365, 0001,003C,0180,09F0,0000,1366 :3156 RC[0E] D
U 1366, 0010,0038,01C0,0920,0000,10B8 :3157 Q RC[4]
U 10B8, 0001,203D,0180,09D8,0000,111A :3158 =00 CALL,J/RM0H1,RC[0B],Q ; CHECK THE GROUP 0 HIT AT 1B6DB000
U 10B9, 0000,003D,0180,0800,0000,1247 :3159 ERROR1 ; UNEXPECTED UTRAP OCCURRED.
U 10BA, 0000,003D,0180,0800,0000,1247 :3160 ERROR1 ; HIT/MISS BITS INCORRECT
U 10BB, 001D,2000,0180,0800,0010,1367 :3161 ALU_Q-D,CLK.UBCC ; CHECK THE DATA AT 1B6DB000, =99999999
U 1367, 0000,013C,0180,0800,0000,11C8 :3162 Z?
U 11C8, 0000,003D,0180,0800,0000,1247 :3163 =0 ERROR1

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U 11C9, 0000,003C,0180,0800,0000,11CA ;3164 NOP

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:3165 .PAGE "TEST D3 ADDRESS PATH TO GROUP 0 TAG MEMORY TEST"
:3166 *****
:3167 **
:3168 TEST D3 ADDRESS PATH TO GROUP 0 TEST
:3169
:3170 TEST DESCRIPTION
:3171 THIS IS A TEST OF LOCATION ZERO (PA<11:03>=0) IN THE ADDRESS
:3172 MEMORY OF GROUP 0. TAGS WILL BE GENERATED BE FLOATING
:3173 A ONE THROUGH A FIELD OF ZEROES AND A ZERO THROUGH A FIELD OF ONES.
:3174
:3175 LOGIC DESCRIPTION
:3176 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:3177 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:3178 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:3179 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:3180 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:3181 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:3182 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:3183 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:3184 REGISTER ON THE SBI CONTROL MODULE.
:3185
:3186 ERROR DESCRIPTION
:3187 VA REFERENCED
:3188 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:3189 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
:3190 BITS ARE RELEVANT)
:3191 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:3192 UTRAP OCCURS
:3193 GOT CACHE MAINT REGISTER
:3194 EXPECTED READ DATA
:3195 GOT READ DATA
:3196 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:3197 FLAG UTRAP TYPE
:3198 ----
:3199 1DE NO UTRAP OCCURRED
:3200 DE CACHE PARITY UTRAP
:3201 15E TB PARITY ERROR
:3202 19E TB MISS
:3203 1CE TB PROTECTION ERROR
:3204 1D6 TB MODIFY BIT ERROR
:3205 1DA X PAGE UTRAP
:3206 1DC UNALIGNED DATA UTRAP
:3207
:3208 --
:3209 *****
:3210 =0
:3211 ADRG0: NEWTST
:3212 D 0,RC[OF] K[.6]
:3213 =0 CALL J/DC.TDE ; INITIALIZE THE UTRAP FLAG
:3214 R[OE]_D
:3215 D 0
:3216 =0 ID[TERO] D,CALL,J/CAPAT ; TB OFF AND GENERATE SOME CONSTANTS
:3217 VA K[ZERO] ; INVALIDATE LOCATION 0 IN BOTH GROUPS
:3218 FS7MCT,MCT/INVALIDATE
:3219 =0 CALL J/ROS ; SET FORCE REPLACE GROUP 0 BIT

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U 11CA, 0000,003D,0180,0800,0000,1233
U 11CB, 0F18,0038,D580,09F8,0000,11CC
U 11CC, 0000,003D,0180,0800,0000,1250
U 11CD, 0001,003C,0180,0AF0,0000,1368
U 1368, 0F00,003C,0180,0800,0000,11CE
U 11CE, 0000,003D,4980,3C00,0000,12A7
U 11CF, 0018,0038,1980,0800,0200,1369
U 1369, 0000,003C,0180,9000,0000,11D0
U 11D0, 0000,003D,0180,0800,0000,1296

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U 11D1.	0010.0038.0180.0918.0200.136A	:3220	VA RC[3]	: VA=06666000
U 136A.	0810.0038.0180.0910.0000.136B	:3221	D RC[2]	: DATA=55555555
U 136B.	0000.003C.0180.9800.0000.11D2	:3222	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 11D2.	0000.003D.0180.0800.0000.129A	:3223	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 11D3.	0010.0038.0180.0908.0200.136C	:3224	VA RC[1]	: VA=19999000
U 136C.	0810.0038.0180.0900.0000.136D	:3225	D RC[0]	: DATA=AAAAAAAA
U 136D.	0000.003C.0180.9800.0000.11D4	:3226	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 11D4.	0000.003D.0180.0800.0000.1292	:3227	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 11D5.	0018.0038.6580.0A80.0000.136E	:3228	R[0] K[.10]	: INITIALIZE A COUNTER
U 136E.	0000.003C.6180.0800.0084.736F	:3229	SC K[.F]	: GENERATE AN ADDRESS MASK
U 136F.	0803.0010.0180.0800.0000.1370	:3230	ALD MASK+1,D_ALU	
U 1370.	0200.003C.0180.0800.0000.1371	:3231	D_D.RIGHT2,SI/ZERO	
U 1371.	0600.003C.0180.0800.0000.1372	:3232	D_D.RIGHT,SI/ZERO	
U 1372.	0001.003C.0180.0A88.0000.11D6	:3233	R[1] D	: R[1]=1FFFE000
U 11D6.	0000.003D.0180.0800.0000.1246	:3234	ERLOOP	
U 11D7.	0800.003C.0180.0A00.0000.1373	:3235	ADRGOA: D RC[0]	: GENERATE TEST ADDRESS
U 1373.	0018.0038.85C0.0800.0000.1374	:3236	Q K[.C]	: ADDRESS= 1 IN 0'S PATTERN
U 1374.	001D.2014.0180.0A90.0082.1375	:3237	ALU Q+D, SC ALU, R[2] ALU	
U 1375.	0800.0024.0180.0A08.0200.1376	:3238	ALU R[1].ANDNOT.MASK,VA_ALU,D_ALU	
U 1376.	0001.003C.0180.09F0.0000.11D8	:3239	RC[0E] D	
U 11D8.	0000.003D.0180.0800.0000.1296	:3240	CALL J7ROS	: SET FORCE REPLACE GROUP 0 BIT
U 11D9.	0810.0038.0180.0920.0000.1377	:3241	D RC[4]	: DATA=99999999
U 1377.	0000.003C.0180.9800.0000.11DA	:3242	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 11DA.	0000.003D.0180.0800.0000.1292	:3243	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 11DB.	0010.0038.01C0.0920.0000.10BC	:3244	Q RC[4]	
U 10BC.	0F01.203D.0180.09D8.0000.111A	:3245	D_O, CALL J/RHOM1, RC[0B]_Q	: CHECK FOR HIT IN GROUP 0 AT TEST ADDRESS
U 10BD.	0000.003D.0180.0800.0000.1247	:3246	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10BE.	0000.003D.0180.0800.0000.1247	:3247	ERROR1	: HIT/MISS BITS INCORRECT
U 10BF.	001D.2000.0180.0800.0010.1378	:3248	ALU Q-D, CLK.UBCC	: CHECK THAT THE DATA=99999999
U 1378.	0000.013C.0180.0800.0000.11DC	:3249	Z?	
U 11DC.	0000.003D.0180.0800.0000.1247	:3250	ERROR1	: DATA INCORRECT
U 11DD.	0000.003C.0180.0A10.0082.1379	:3251	SC R[2]	: NOW TRY 0 IN 1'S PATTERN
U 1379.	0800.0034.0180.0A08.0200.137A	:3252	ALD R[1].AND.MASK,VA_ALU,D_ALU	
U 137A.	0001.003C.0180.09F0.0000.11DE	:3253	RC[0E] D	
U 11DE.	0000.003D.0180.0800.0000.1296	:3254	CALL J7ROS	: SET FORCE REPLACE GROUP 0 BIT
U 11DF.	0810.0038.0180.0930.0000.137B	:3255	D RC[6]	: DATA=66666666
U 137B.	0000.003C.0180.9800.0000.11E0	:3256	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 11E0.	0000.003D.0180.0800.0000.1292	:3257	CALL J/SOFF	: CLEAR FORCE REPLACE BITS.
U 11E1.	0F00.003C.0180.0800.0000.137C	:3258	D_O	
U 137C.	0010.0038.01C0.0930.0000.10C0	:3259	Q RC[6]	
U 10C0.	0001.203D.0180.09D8.0000.111A	:3260	CALL J/RHOM1, RC[0B]_Q	: CHECK GROUP 0 HIT AT TEST ADDRESS
U 10C1.	0000.003D.0180.0800.0000.1247	:3261	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10C2.	0000.003D.0180.0800.0000.1247	:3262	ERROR1	: HIT/MISS BITS INCORRECT
U 10C3.	001D.2000.0180.0800.0010.137D	:3263	ALU Q-D, CLK.UBCC	: CHECK DATA=66666666
U 137D.	0000.013C.0180.0800.0000.11E2	:3264	Z?	
U 11E2.	0000.003D.0180.0800.0000.1247	:3265	ERROR1	: DATA INCORRECT
U 11E3.	0000.003C.0180.0A00.0010.137E	:3266	ALU R[0], CLK.UBCC	: TRIED ALL TEST PATTERNS?
U 137E.	0000.013C.0180.0800.0000.11E4	:3267	Z?	
U 11E4.	0018.0000.0580.0A80.0000.11D7	:3268	R[0] LA-K[.1], J/ADRGOA	: IF NOT CONTINUE
U 11E5.	0810.0038.0180.0908.0200.137F	:3269	VA RC[1], D RC[1]	: VA=19999000, SHOULD STILL BE A HIT IN
U 137F.	0001.003C.0180.09F0.0000.1380	:3270	RC[0E] D	: GROUP 1.
U 1380.	0010.0038.01C0.0900.0000.10C4	:3271	Q RC[0]	
U 10C4.	0001.203D.0180.09D8.0000.111C	:3272	CALL J/RHOM1, RC[0B]_Q	
U 10C5.	0000.003D.0180.0800.0000.1247	:3273	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10C6.	0000.003D.0180.0800.0000.1247	:3274	ERROR1	: HIT/MISS BITS INCORRECT

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U 10C7,	001D,2000,0180,0800,0010,1381	:3275		ALU_Q-D,CLK.UBCC
U 1381,	0000,013C,0180,0800,0000,11E6	:3276		Z?
U 11E6,	0000,003D,0180,0800,0000,1247	:3277	=0	ERROR1
U 11E7,	0000,003C,0180,0800,0000,11E8	:3278		NOP

: CHECK DATA AT 19999000, =AAAAAAA

: DATA INCORRECT

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:3279
:3280
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:3289
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:3297
:3298
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:3320
:3321
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.PAGE "TEST D4 ADDRESS PATH TO GROUP 1 TAG MEMORY TEST"
*****
++
TEST D4 ADDRESS PATH TO GROUP 1 TEST

TEST DESCRIPTION
THIS IS A TEST OF LOCATION ZERO (PA<11:03>=0) IN THE
ADDRESS MEMORY OF GROUP ONE. TAGS USED AS TEST PATTERN ARE
GENERATED BY FLOATING A ZERO THROUGH A FIELD OF ONES
AND A ONE THROUGH A FIELD OF ZEROES.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCCRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.

ERROR DESCRIPTION
VA REFERENCED
EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
BITS ARE RELEVANT)
OR GOT CACHE PARITY REGISTER IF UNEXPECTED
UTRAP OCCURS
GOT CACHE MAINT REGISTER
EXPECTED READ DATA
GOT READ DATA
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
-----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

--
*****
=0
ADRG1: NEWTST
D 0,RC[OF] K[.6]
=0 CALL J/DC.TDE ; INITIALIZE THE UTRAP FLAG
R[OE]_D
D 0
=0 ID[TERO] D,CALL,J/CAPAT ; TB OFF, AND GENERATE SOME TEST PATTERNS
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0 IN BOTH GROUPS
FS7MCT,MCT/INVALIDATE

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U 11E8, 0000,003D,0180,0800,0000,1233
U 11E9, 0F18,0038,D580,09F8,0000,11EA
U 11EA, 0000,003D,0180,0800,0000,1250
U 11EB, 0001,003C,0180,0AF0,0000,1382
U 1382, 0F00,003C,0180,0800,0000,11EC
U 11EC, 0000,003D,4980,3C00,0000,12A7
U 11ED, 0F18,0038,1980,0800,0200,1383
U 1383, 0000,003C,0180,9000,0000,11EE

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U 11EE,	0000,003D,0180,0800,0000,1296	:3334	=0	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 11EF,	0010,0038,0180,0938,0200,1384	:3335		VA RC[7]	: VA=04924000
U 1384,	0810,0038,0180,0930,0000,1385	:3336		D RC[6]	: DATA=66666665
U 1385,	0000,003C,0180,9800,0000,11F0	:3337		FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 11F0,	0000,003D,0180,0800,0000,129A	:3338	=0	CALL,J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 11F1,	0010,0038,0180,0928,0200,1386	:3339		VA RC[5]	: VA=186DP000
U 1386,	0810,0038,0180,0920,0000,1387	:3340		D RC[4]	: DATA=99999999
U 1387,	0000,003C,0180,9800,0000,11F2	:3341		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 11F2,	0000,003D,0180,0800,0000,1292	:3342	=0	CALL,J/SOFF	: TURN OFF FORCE REPLACE BITS
U 11F3,	0018,0038,6580,0A80,0000,1388	:3343		RC[0] K[.10]	: INITIALIZE A COUNTER
U 1388,	0000,003C,6180,0800,0084,7389	:3344		SC K[F]	: GENERATE AN ADDRESS MASK
U 1389,	0803,0010,0180,0800,0000,138A	:3345		ALD_MASK+1,D_ALU	
U 138A,	0200,003C,0180,0800,0000,138B	:3346		D_D.RIGHT2,SI/ZERO	
U 138B,	0600,003C,0180,0800,0000,138C	:3347		D_D.RIGHT,SI/ZERO	
U 138C,	0001,003C,0180,0A88,0000,11F4	:3348		RC[1] D	: R[1]=1FFFE000
U 11F4,	0000,003D,0180,0800,0000,1246	:3349	=0	ERLOOP	
U 11F5,	0800,003C,0180,0A00,0000,138D	:3350	ADRG1A:	D_RC[0]	: GENERATE TEST ADDRESS
U 138D,	0018,0038,85C0,0800,0000,138E	:3351		Q_K[C]	: A 1 IN 0'S
U 138E,	001D,2014,0180,0A90,0082,138F	:3352		ALU_Q+D,SC_ALU,RC[2]_ALU	
U 138F,	0800,0024,0180,0A08,0200,1390	:3353		ALU_R[1].ANDNOT.MASK,VA_ALU,D_ALU	
U 1390,	0001,003C,0180,09F0,0000,11F6	:3354		RC[0E] D	
U 11F6,	0000,003D,0180,0800,0000,129A	:3355	=0	CALL,J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 11F7,	0810,0038,0180,0900,0000,1391	:3356		D_RC[0]	: DATA=AAAAAAAA
U 1391,	0000,003C,0180,9800,0000,11F8	:3357		FS/MCT,MCT/VALIDATE	: WRITE TEST PATTERN INTO GROUP 1
U 11F8,	0000,003D,0180,0800,0000,1292	:3358	=0	CALL,J/SOFF	: CLEAR FORCE REPLACE BITS
U 11F9,	0000,003C,0180,0800,0000,1392	:3359		NOP	
U 1392,	0010,0038,01C0,0900,0000,10C8	:3360		Q_RC[0]	
U 10C8,	0F01,203D,0180,09D8,0000,111C	:3361	=00	D_O.CALL,J/RM0H1,RC[0B]_Q	: READ TEST ADDRESS, SHOULD BE A HIT IN GROUP 1
U 10C9,	0000,003D,0180,0800,0000,1247	:3362		ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10CA,	0000,003D,0180,0800,0000,1247	:3363		ERROR1	: HIT/MISS BITS INCORRECT
U 10CB,	001D,2000,0180,0800,0010,1393	:3364		ALU_Q-D,CLK.UBCC	: CHECK DATA READ, =AAAAAAAA
U 1393,	0000,013C,0180,0800,0000,11FA	:3365		Z?	
U 11FA,	0000,003D,0180,0800,0000,1247	:3366	=0	ERROR1	: DATA INCORRECT
U 11FB,	0000,003C,0180,0A10,0082,1394	:3367		SC_R[2]	: GENERATE TEST ADDRESS PATTERN
U 1394,	0800,0034,0180,0A08,0200,1395	:3368		ALD_R[1].AND.MASK,VA_ALU,D_ALU	: A 0 IN 1'S
U 1395,	0001,003C,0180,09F0,0000,11FC	:3369		RC[0E] D	
U 11FC,	0000,003D,0180,0800,0000,129A	:3370	=0	CALL,J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 11FD,	0810,0038,0180,0910,0000,1396	:3371		D_RC[2]	: DATA=55555555
U 1396,	0000,003C,0180,9800,0000,11FE	:3372		FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 11FE,	0000,003D,0180,0800,0000,1292	:3373	=0	CALL,J/SOFF	: CLEAR FORCE REPLACE BITS
U 11FF,	0F00,003C,0180,0800,0000,1397	:3374		D_O	
U 1397,	0010,0038,01C0,0910,0000,10CC	:3375		Q_RC[2]	
U 10CC,	0001,203D,0180,09D8,0000,111C	:3376	=00	CALL,J/RM0H1,RC[0B]_Q	: READ TEST ADDRESS, SHOULD BE A GROUP 1 HIT
U 10CD,	0000,003D,0180,0800,0000,1247	:3377		ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10CE,	0000,003D,0180,0800,0000,1247	:3378		ERROR1	: HIT/MISS BITS INCORRECT
U 10CF,	001D,2000,0180,0800,0010,1398	:3379		ALU_Q-D,CLK.UBCC	: CHECK DATA READ, =55555555
U 1398,	0000,013C,0180,0800,0000,1200	:3380		Z?	
U 1200,	0000,003D,0180,0800,0000,1247	:3381	=0	ERROR1	: DATA INCORRECT
U 1201,	0000,003C,0180,0A00,0010,1399	:3382		ALU_R[0],CLK.UBCC	: TRIED ALL TEST PATTERNS?
U 1399,	0000,013C,0180,0800,0000,1202	:3383		Z?	
U 1202,	0018,0000,0580,0A80,0000,11F5	:3384	=0	RC[0] LA-K[.1],J/ADRG1A	: IF NOT THEN CONTINUE
U 1203,	0810,0038,0180,0938,0200,139A	:3385		VA RC[7],D_RC[7]	: VA=04924000, SHOULD STILL BE A
U 139A,	0001,003C,0180,09F0,0000,139B	:3386		RC[0E] D	: HIT IN GROUP 0
U 139B,	0010,0038,01C0,0930,0000,10D0	:3387		Q_RC[6]	
U 10D0,	0001,203D,0180,09D8,0000,111A	:3388	=00	CALL,J/RM0H1,RC[0B]_Q	

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U 10D1, 0000,003D,0180,0800,0000,1247 :3389
U 10D2, 0000,003D,0180,0800,0000,1247 :3390
U 10D3, 001D,2000,0180,0800,0010,139C :3391
U 139C, 0000,013C,0180,0800,0000,1204 :3392
U 1204, 0000,003D,0180,0800,0000,1247 :3393
U 1205, 0000,003C,0180,0800,0000,1206 :3394

=0

ERROR1
ERROR1
ALU_Q-D,CLK.UBCC
Z?
ERROR1
NOP

; UNEXPECTED UTRAP OCCURRED
; HIT/MISS BITS INCORRECT
; CHECK DATA AT 04924000, =66666666
; DATA INCORRECT


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:3395 .PAGE "TEST D5 GROUP 0 HIT/MISS COMPARATORS TEST"
:3396 *****
:3397 ++
:3398 TEST D5 GROUP 0 HIT/MISS COMPARATORS TEST
:3399
:3400 TEST DESCRIPTION
:3401 THIS IS A TEST OF THE HIT MISS COMPARATORS OF GROUP ZERO.
:3402
:3403 LOGIC DESCRIPTION
:3404 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:3405 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:3406 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:3407 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:3408 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:3409 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:3410 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:3411 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:3412 REGISTER ON THE SBI CONTROL MODULE.
:3413
:3414 ERROR DESCRIPTION
:3415 ADDRESS WHICH SHOULD BE A HIT
:3416 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:3417 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
:3418 BITS ARE RELEVANT)
:3419 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:3420 UTRAP OCCURS
:3421 GOT CACHE MAINT REGISTER
:3422 EXPECTED READ DATA
:3423 GOT READ DATA
:3424 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:3425 FLAG UTRAP TYPE
:3426 -----
:3427 1DE NO UTRAP OCCURRED
:3428 DE CACHE PARITY UTRAP
:3429 15E TB PARITY ERROR
:3430 19E TB MISS
:3431 1CE TB PROTECTION ERROR
:3432 1D6 TB MODIFY BIT ERROR
:3433 1DA X PAGE UTRAP
:3434 1DC UNALIGNED DATA UTRAP
:3435 ADDRESS REFERENCED
:3436
:3437 --
:3438 *****
:3439 =0
:3440 COMGO: NEWTST
:3441 D 0,RC[0F] K[.7]
:3442 =0 CALL J/DC.TDE ; INITIALIZE THE UTRAP FLAG
:3443 R[0E]_D
:3444 D 0
:3445 =0 ID[TBERO] D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
:3446 VA K[ZERO] ; INVALIDATE LOCATION 0 IN BOTH GROUPS
:3447 FS7MCT,MCT/INVALIDATE
:3448 =0 CALL J/ROS ; SET FORCE REPLACE GROUP 0 BIT
:3449 VA_RC[5] ; VA=1B6DB000

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U 1206, 0000,003D,0180,0800,0000,1233
U 1207, 0F18,0038,5D80,09F8,0000,1208
U 1208, 0000,003D,0180,0800,0000,1250
U 1209, 0001,003C,0180,0AF0,0000,139D
U 139D, 0F00,003C,0180,0800,0000,120A
U 120A, 0000,003D,4980,3C00,0000,12A7
U 120B, 0018,0038,1980,0800,0200,139E
U 139E, 0000,003C,0180,9000,0000,120C
U 120C, 0000,003D,0180,0800,0000,1296
U 120D, 0010,0038,0180,0928,0200,139F

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U 139F.	0810.0038.0180.0920.0000.13A0	:3450	D RC[4]	: DATA=99999999
U 13A0.	0000.003C.0180.9800.0000.120E	:3451	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 120E.	0000.003D.0180.0800.0000.129A	:3452	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 120F.	0010.0038.0180.0938.0200.13A1	:3453	VA RC[7]	: VA=04924000
U 13A1.	0810.0038.0180.0930.0000.13A2	:3454	D RC[6]	: DATA=66666666
U 13A2.	0000.003C.0180.9800.0000.1210	:3455	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 1210.	0000.003D.0180.0800.0000.1292	:3456	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 1211.	0018.0038.6580.0A80.0000.13A3	:3457	R[0] K[10]	: INITIATIALIZE A COUNTER
U 13A3.	0000.003C.6180.0800.0084.73A4	:3458	SC K[F]	: GENERATE A MASK FOR THE ADDRESS TAG.
U 13A4.	0803.0010.0180.0800.0000.13A5	:3459	ALU MASK+1,D ALU	
U 13A5.	0200.003C.0180.0800.0000.13A6	:3460	D D RIGHT2,SI/ZERO	
U 13A6.	0600.003C.0180.0800.0000.13A7	:3461	D D RIGHT,SI/ZERO	
U 13A7.	0001.003C.0180.0A88.0000.1212	:3462	R[1] D	: R[1]=1FFFE000
U 1212.	0000.003D.0180.0800.0000.1246	:3463	ERLOOP	
U 1213.	0800.003C.0180.0A00.0000.13A8	:3464	COMGOA: D RC[0]	: GENERATE TEST ADDRESS PATTERNS
U 13A8.	0018.0038.85C0.0800.0000.13A9	:3465	Q K[C]	: OF 1' IN 0'S, AND 0 IN 1'S.
U 13A9.	001D.2014.0180.0A90.0082.13AA	:3466	ALU Q+D,SC ALU,R[2] ALU	
U 13AA.	0800.0024.0180.0A08.0000.13AB	:3467	ALU R[1].ANDNOT.MASK,D ALU	
U 13AB.	0001.003C.0180.0A98.0000.13AC	:3468	R[3] D	
U 13AC.	0800.0034.0180.0A08.0000.13AD	:3469	ALU R[1].AND.MASK,D ALU	
U 13AD.	0001.003C.0180.0AA0.0000.1214	:3470	R[4] D	
U 1214.	0000.003D.0180.0800.0000.1296	:3471	CALL J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 1215.	0018.0038.1980.09F0.0200.13AE	:3472	VA K[ZERO],RC[0E] ALU	: MAKE 0 A HIT IN GROUP 0
U 13AE.	0810.0038.0180.0900.0000.13AF	:3473	D RC[0]	: DATA=AAAAAAAA
U 13AF.	0000.003C.0180.9800.0000.1216	:3474	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 1216.	0000.003D.0180.0800.0000.1292	:3475	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 1217.	0800.003C.0180.0A18.0200.13B0	:3476	VA R[3],D R[3]	: REFERENCE 1 IN 0'S TEST PATTERN
U 13B0.	0001.003C.0180.09C0.0000.10D4	:3477	RC[8] D	: WITH 0 A HIT IN GROUP 0
U 10D4.	0000.003D.0180.0800.0000.111E	:3478	CALL J/RMOM1	: REFERENCE SHOULD BE A MISS
U 10D5.	0000.003D.0180.0800.0000.1247	:3479	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10D6.	0000.003D.0180.0800.0000.1247	:3480	ERROR1	: HIT/MISS BITS INCORRECT
U 10D7.	0018.0038.1980.09C0.0200.13B1	:3481	VA K[ZERO],RC[8] ALU	: REFERENCE VA=0
U 13B1.	0010.0038.01C0.0900.0000.10D8	:3482	Q RC[0]	
U 10D8.	0001.203D.0180.09D8.0000.111A	:3483	CALL J/RMOM1,RC[0B] Q	: SHOULD BE A HIT
U 10D9.	0000.003D.0180.0800.0000.1247	:3484	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10DA.	0000.003D.0180.0800.0000.1247	:3485	ERROR1	: HIT/MISS BITS INCORRECT
U 10DB.	001D.2000.0180.0800.0010.13B2	:3486	ALU Q-D,CLK.UBCC	: CHECK DATA AT 0, =AAAAAAAA
U 13B2.	0000.013C.0180.0800.0000.1218	:3487	Z?	
U 1218.	0000.003D.0180.0800.0000.1247	:3488	ERROR1	: DATA INCORRECT
U 1219.	0000.003C.0180.0800.0000.121A	:3489	NOP	
U 121A.	0000.003D.0180.0800.0000.1296	:3490	CALL J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 121B.	0800.003C.0180.0A18.0200.13B3	:3491	VA R[3],D R[3]	: MAKE 1 IN 0'S PATTERN A HIT IN GROUP 0
U 13B3.	0001.003C.0180.09F0.0000.13B4	:3492	RC[0E] D	
U 13B4.	0810.0038.0180.0910.0000.13B5	:3493	D RC[2]	: DATA=55555555
U 13B5.	0000.003C.0180.9800.0000.121C	:3494	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 121C.	0000.003D.0180.0800.0000.1292	:3495	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 121D.	0018.0038.1980.09C0.0200.10DC	:3496	VA K[ZERO],RC[8] ALU	: REFERENCE 0, SHOULD BE A MISS
U 10DC.	0000.003D.0180.0800.0000.111E	:3497	CALL J/RMOM1	: WITH 1 IN 0'S PATTERN A HIT
U 10DD.	0000.003D.0180.0800.0000.1247	:3498	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10DE.	0000.003D.0180.0800.0000.1247	:3499	ERROR1	: HIT/MISS BITS INCORRECT
U 10DF.	0800.003C.0180.0A18.0200.13B6	:3500	VA R[3],D R[3]	: REFERENCE 1 IN 0'S PATTERN
U 13B6.	0001.003C.0180.09C0.0000.13B7	:3501	RC[0B] D	
U 13B7.	0010.0038.01C0.0910.0000.10E0	:3502	Q RC[2]	
U 10E0.	0001.203D.0180.09D8.0000.111A	:3503	CALL J/RMOM1,RC[0B] Q	: SHOULD BE A HIT
U 10E1.	0000.003D.0180.0800.0000.1247	:3504	ERROR1	: UNEXPECTED UTRAP OCCURRED

U 10E2,	0000,003D,0180,0800,0000,1247	:3505	ERROR1	: HIT/MISS BITS INCORRECT
U 10E3,	001D,2000,0180,0800,0010,13B8	:3506	ALU_Q-D,CLK.UBCC	: CHECK DATA=55555555
U 13B8,	0000,013C,0180,0800,0000,121E	:3507	Z?	
U 121E,	0000,003D,0180,0800,0000,1247	:3508	ERROR1	: DATA INCORRECT
U 121F,	0000,003C,0180,0800,0000,1220	:3509	NOP	
U 1220,	0000,003D,0180,0800,0000,1296	:3510	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 1221,	0800,003C,0180,0A08,0200,13B9	:3511	VA R[1],D_R[1]	: MAKE ADDRESS 1FFFE000 A HIT
U 13B9,	0001,003C,0180,09F0,0000,13BA	:3512	RC[0E] D	: IN GROUP 0
U 13BA,	0810,0038,0180,0900,0000,13BB	:3513	D RC[0]	: DATA=AAAAAAAA
U 13BB,	0000,003C,0180,9800,0000,1222	:3514	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 1222,	0000,003D,0180,0800,0000,1292	:3515	CALL,J/SOFF	: CLEAR FORCE REPLACE BITS
U 1223,	0800,003C,0180,0A20,0200,13BC	:3516	VA R[4],D_R[4]	: REFERENCE 0 IN 1'S PATTERN
U 13BC,	0001,003C,0180,09C0,0000,10E4	:3517	RC[8] D	: WHILE 1FFFE000 IS A HIT
U 10E4,	0000,003D,0180,0800,0000,111E	:3518	CALL,J/RMOM1	: 0 IN 1'S SHOULD BE A MISS
U 10E5,	0000,003D,0180,0800,0000,1247	:3519	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10E6,	0000,003D,0180,0800,0000,1247	:3520	ERROR1	: HIT/MISS BITS INCORRECT
U 10E7,	0800,003C,0180,0A08,0200,13BD	:3521	VA R[1],D_R[1]	: REFERENCE ADDRESS 1FFFE000
U 13BD,	0001,003C,0180,09C0,0000,13BE	:3522	RC[8] D	
U 13BE,	0010,0038,01C0,0900,0000,10E8	:3523	Q RC[0]	
U 10E8,	0001,203D,0180,09D8,0000,111A	:3524	CALL,J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT
U 10E9,	0000,003D,0180,0800,0000,1247	:3525	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10EA,	0000,003D,0180,0800,0000,1247	:3526	ERROR1	: HIT/MISS BITS INCORRECT
U 10EB,	001D,2000,0180,0800,0010,13BF	:3527	ALU_Q-D,CLK.UBCC	: DATA AT ADDRESS 1FFFE000, =AAAAAAAA
U 13BF,	0000,013C,0180,0800,0000,1224	:3528	Z?	
U 1224,	0000,003D,0180,0800,0000,1247	:3529	ERROR1	: DATA INCORRECT
U 1225,	0000,003C,0180,0800,0000,1226	:3530	NOP	
U 1226,	0000,003D,0180,0800,0000,1296	:3531	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT
U 1227,	0800,003C,0180,0A20,0200,13C0	:3532	VA R[4],D_R[4]	: MAKE 0 IN 1'S PATTERN A HIT IN
U 13C0,	0001,003C,0180,09F0,0000,13C1	:3533	RC[0E] D	: GROUP 0
U 13C1,	0810,0038,0180,0910,0000,13C2	:3534	D RC[2]	: DATA=55555555
U 13C2,	0000,003C,0180,9800,0000,1228	:3535	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 1228,	0000,003D,0180,0800,0000,1292	:3536	CALL,J/SOFF	: CLEAR FORCE REPLACE BITS
U 1229,	0800,003C,0180,0A08,0200,13C3	:3537	VA R[1],D_R[1]	: REFERENCE ADDRESS 1FFFE000
U 13C3,	0001,003C,0180,09C0,0000,10EC	:3538	RC[8] D	: WITH 0 IN 1'S PATTERN BEING A HIT
U 10EC,	0000,003D,0180,0800,0000,111E	:3539	CALL,J/RMOM1	: 1FFFE000 SHOULD BE A MISS
U 10ED,	0000,003D,0180,0800,0000,1247	:3540	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10EE,	0000,003D,0180,0800,0000,1247	:3541	ERROR1	: HIT/MISS BITS INCORRECT
U 10EF,	0000,003C,0180,0A20,0200,13C4	:3542	VA R[4]	: REFERENCE 0 IN 1'S PATTERN
U 13C4,	0001,003C,0180,09C0,0000,13C5	:3543	RC[8] D	
U 13C5,	0010,0038,01C0,0910,0000,10F0	:3544	Q RC[2]	
U 10F0,	0001,203D,0180,09D8,0000,111A	:3545	CALL,J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT
U 10F1,	0000,003D,0180,0800,0000,1247	:3546	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10F2,	0000,003D,0180,0800,0000,1247	:3547	ERROR1	: HIT/MISS BITS INCORRECT
U 10F3,	001D,2000,0180,0800,0010,13C6	:3548	ALU_Q-D,CLK.UBCC	: DATA=55555555
U 13C6,	0000,013C,0180,0800,0000,122A	:3549	Z?	
U 122A,	0000,003D,0180,0800,0000,1247	:3550	ERROR1	: DATA INCORRECT
U 122B,	0000,003C,0180,0800,0000,13C7	:3551	NOP	
U 13C7,	0000,003C,0180,0A00,0010,13C8	:3552	ALU_R[0],CLK.UBCC	: TRIED ALL PATTERNS?
U 13C8,	0000,013C,0180,0800,0000,122C	:3553	Z?	
U 122C,	0018,0000,0580,0A80,0000,1213	:3554	R[0] LA-K[.1],J/COMGOA	: IF NOT CONTINUE
U 122D,	0810,0038,0180,0938,0200,13C9	:3555	VA R[7],D_R[7]	: REFERENCE ADDRESS 04924000
U 13C9,	0001,003C,0180,09C0,0000,13CA	:3556	RC[8] D	
U 13CA,	0001,003C,0180,09F0,0000,13CB	:3557	RC[0E] D	
U 13CB,	0010,0038,01C0,0930,0000,10F4	:3558	Q RC[6]	
U 10F4,	0001,203D,0180,09D8,0000,111C	:3559	CALL,J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT IN GROUP 1

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U 10F5,	0000,003D,0180,0800,0000,1247	:3560	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 10F6,	0000,003D,0180,0800,0000,1247	:3561	ERROR1	: HIT/MISS BITS INCORRECT
U 10F7,	001D,2000,0180,0800,0010,13CC	:3562	ALU_Q-D,CLK.UBCC	: DATA=66666665
U 13CC,	0000,013C,0180,0800,0000,122E	:3563	Z?	
U 122E,	0000,003D,0180,0800,0000,1247	:3564	=0 ERROR1	: DATA INCORRECT
U 122F,	0000,003C,0180,0800,0000,1230	:3565	NOP	
		:3566	=0	
U 1230,	0000,003D,0180,0800,0000,1233	:3567	DUMMY1: NEWTST	

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Location	0/B	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - 0FFF Unused								
U 1000	1871:	1838	1845=	1861=	2293=	2297=	2298=	2301=
U 1008	2327=	2328=	2329=	2330=	2341=	2342=	2343=	2344=
U 1010	2363=	2364=	2365=	2371=	2374=	2375=	2376=	2377=
U 1018	2388=	2390=	2391=	2392=	2411=	2412=	2413=	2419=
U 1020	2422=	2423=	2424=	2425=	2436=	2438=	2439=	2440=
U 1028	2453=	2455=	2456=	1839	2464=	2465=	2466=	2467=
U 1030	2478=	2479=	2480=	2481=	2494=	2495=	2496=	1840
U 1038	2504=	2505=	2506=	2507=	2518=	2519=	2520=	2521=
U 1040	2538=	2539=	2540=	2546=	2549=	2551=	2552=	2553=
U 1048	2570=	2572=	2573=	2574=	1862=	1863=	1902:	1841
U 1050	2589=	2590=	2591=	2597=	2600=	2601=	2602=	2603=
U 1058	1951=	1952=	1905:	1842	1977=	1978=	1908:	1843
U 1060	2620=	2622=	2623=	2624=	2666=	2667=	2668=	2669=
U 1068	2680=	2682=	2683=	2684=	2723=	2725=	2726=	2727=
U 1070	2738=	2739=	2740=	2741=	2812=	2813=	2814=	2815=
U 1078	2817=	2818=	2819=	2820=	2827=	2828=	2829=	2830=
U 1080	2837=	2838=	2839=	2840=	2911=	2912=	2913=	2914=
U 1088	2916=	2917=	2918=	2919=	2926=	2927=	2928=	2929=
U 1090	2936=	2937=	2938=	2939=	3014=	3015=	3016=	1844
U 1098	3018=	3019=	3020=	3021=	3030=	3031=	3032=	1864
U 10A0	3034=	3035=	3036=	3037=	3047=	3048=	3049=	3050=
U 10A8	3125=	3126=	3127=	1865	3129=	3130=	3131=	3132=
U 10B0	3141=	3142=	3143=	1866	3145=	3146=	3147=	3148=
U 10B8	3158=	3159=	3160=	3161=	3245=	3246=	3247=	3248=
U 10C0	3260=	3261=	3262=	3263=	3272=	3273=	3274=	3275=
U 10C8	3361=	3362=	3363=	3364=	3376=	3377=	3378=	3379=
U 10D0	3388=	3389=	3390=	3391=	3478=	3479=	3480=	3481=
U 10D8	3483=	3484=	3485=	3486=	3497=	3498=	3499=	3500=
U 10E0	3503=	3504=	3505=	3506=	3518=	3519=	3520=	3521=
U 10E8	3524=	3525=	3526=	3527=	3539=	3540=	3541=	3542=
U 10F0	3545=	3546=	3547=	3548=	3559=	3560=	3561=	3562=
U 10F8	1980=	1981=	1983=	1984=	1987=	1988=	1990=	1991=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1867	1993=	1994=	1834:	1835:	1836:	1837:
U 1110	1997=	1998=	2001=	2002=	2007=	2008=	2010=	2011=
U 1118	2020=	2021=	2023=	2024=	2026=	2027=	2029=	2030=
U 1120	2050=	2051=	2059=	2060=	2073=	2074=	2121=	2122=
U 1128	2124=	2125=	2129=	2130=	2132=	2133=	2144=	2145=
U 1130	2146=	2147=	2148=	2149=	2270=	2271=	2272=	2276=
U 1138	2277=	2278=	2280=	2285=	2307=	2308=	2315=	2316=
U 1140	2332=	2338=	2346=	2347=	2353=	2354=	2379=	2385=
U 1148	2394=	2395=	2401=	2402=	2427=	2433=	2442=	2443=
U 1150	2469=	2475=	2483=	2484=	1868	1928:	2509=	2515=
U 1158	2523=	2524=	2531=	2536=	2555=	2556=	2561=	2567=
U 1160	2576=	2577=	2582=	2587=	2605=	2606=	2611=	2617=
U 1168	2626=	2627=	2636=	2637=	2671=	2677=	2686=	2687=
U 1170	2695=	2696=	2729=	2735=	2743=	2744=	2789=	2790=
U 1178	2791=	2792=	2793=	2794=	2795=	2796=	2800=	2801=
U 1180	2804=	2805=	2808=	2809=	2822=	2824=	2832=	2834=
U 1188	2842=	2843=	2888=	2889=	2890=	2891=	2892=	2893=
U 1190	2894=	2895=	2899=	2900=	2903=	2904=	2907=	2908=
U 1198	2921=	2923=	2931=	2933=	2941=	2942=	2990=	2991=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2992=	2993=	2995=	2996=	2998=	2999=	3002=	3003=
U 11A8	3006=	3007=	3008=	3009=	3024=	3025=	3040=	3041=
U 11B0	3043=	3044=	3052=	3053=	3101=	3102=	3103=	3104=
U 11B8	3106=	3107=	3109=	3110=	3113=	3114=	3117=	3118=
U 11C0	3119=	3120=	3135=	3136=	3151=	3152=	3154=	3155=
U 11C8	3163=	3164=	3211=	3212=	3213=	3214=	3216=	3217=
U 11D0	3219=	3220=	3223=	3224=	3227=	3228=	3234=	3235=
U 11D8	3240=	3241=	3243=	3244=	3250=	3251=	3254=	3255=
U 11E0	3257=	3258=	3265=	3266=	3268=	3269=	3277=	3278=
U 11E8	3326=	3327=	3328=	3329=	3331=	3332=	3334=	3335=
U 11F0	3338=	3339=	3342=	3343=	3349=	3350=	3355=	3356=
U 11F8	3358=	3359=	3366=	3367=	3370=	3371=	3373=	3374=
U 1200	3381=	3382=	3384=	3385=	3393=	3394=	3440=	3441=
U 1208	3442=	3443=	3445=	3446=	3448=	3449=	3452=	3453=
U 1210	3456=	3457=	3463=	3464=	3471=	3472=	3475=	3476=
U 1218	3488=	3489=	3490=	3491=	3495=	3496=	3508=	3509=
U 1220	3510=	3511=	3515=	3516=	3529=	3530=	3531=	3532=
U 1228	3536=	3537=	3550=	3551=	3554=	3555=	3564=	3565=
U 1230	3567=	1869	1870	1880	1881	1882	1883	1884
U 1238	1885	1886	1887	1888	1889	1890	1891	1892
U 1240	1893	1894	1895	1896	1897	1898	1899	1900
U 1248	1901	1903	1904	1936	1937	1943	1944	1945
U 1250	1950	1954	1955	1956	1957	1958	1959	1960
U 1258	1961	1962	1963	1964	1965	1966	1967	1968
U 1260	1969	1970	1971	1972	1973	1974	1975	1979
U 1268	1985	1989	1995	1999	2003	2005	2009	2031
U 1270	2032	2033	2034	2035	2036	2037	2038	2039
U 1278	2040	2041	2042	2043	2044	2045	2046	2047
U 1280	2048	2049	2052	2053	2054	2055	2056	2057
U 1288	2058	2061	2062	2066	2067	2068	2069	2070
U 1290	2071	2072	2080	2081	2082	2083	2085	2086
U 1298	2087	2088	2090	2091	2093	2094	2096	2097
U 12A0	2099	2100	2101	2103	2104	2105	2107	2119
U 12A8	2123	2126	1929:	2127	2131	2134	2135	2136
U 12B0	2137	2138	2139	2140	2141	2142	2143	2150
U 12B8	2151	2152	2153	2154	2155	2156	2157	2158
U 12C0	2279	2286	2306	2309	2310	2317	2318	2324
U 12C8	2325	2326	2331	2339	2340	2345	2355	2356
U 12D0	2361	2362	2372	2373	2378	2386	2387	2393
U 12D8	2403	2404	2409	2410	2420	2421	2426	2434
U 12E0	2435	2441	2450	2451	2452	2463	2468	2476
U 12E8	2477	2482	2491	2492	2493	2503	2508	2516
U 12F0	2517	2522	2537	2547	2548	2554	2568	2569
U 12F8	2575	2588	2598	2599	2604	2618	2619	2625
U 1300	2638	2639	2645	2646	2647	2654	2655	2656
U 1308	2663	2664	2665	2670	2678	2679	2685	2697
U 1310	2698	2704	2705	2706	2712	2713	2714	2720
U 1318	2721	2722	2728	2736	2737	2742	2797	2798
U 1320	2799	2802	2803	2806	2807	2810	2811	2816
U 1328	2821	2825	2826	2831	2835	2836	2841	2896
U 1330	2897	2898	2901	2902	2905	2906	2909	2910
U 1338	2915	2920	2924	2925	2930	2934	2935	2940
U 1340	2994	2997	3000	3001	3004	3005	3011	3012

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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3013	3022	3023	3027	3028	3029	3038	3039
U 1350	3042	3045	3046	3051	3105	3108	3111	3112
U 1358	3115	3116	3122	3123	3124	3133	3134	3138
U 1360	3139	3140	3149	3150	3153	3156	3157	3162
U 1368	3215	3218	3221	3222	3225	3226	3229	3230
U 1370	3231	3232	3233	3236	3237	3238	3239	3242
U 1378	3249	3252	3253	3256	3259	3264	3267	3270
U 1380	3271	3276	3330	3333	3336	3337	3340	3341
U 1388	3344	3345	3346	3347	3348	3351	3352	3353
U 1390	3354	3357	3360	3365	3368	3369	3372	3375
U 1398	3380	3383	3386	3387	3392	3444	3447	3450
U 13A0	3451	3454	3455	3458	3459	3460	3461	3462
U 13A8	3465	3466	3467	3468	3469	3470	3473	3474
U 13B0	3477	3482	3487	3492	3493	3494	3501	3502
U 13B8	3507	3512	3513	3514	3517	3522	3523	3528
U 13C0	3533	3534	3535	3538	3543	3544	3549	3552
U 13C8	3553	3556	3557	3558	3563			
U 13D0 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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	Words not in bounds
ESK00DEF	0
ESK00MAC	0
ESKAHMAC	0
ESKAH2D	989

Used 989
 Remaining

Total microwords used in memory U: 989
 Total microwords remaining in memory U: 0
 Highest address used in memory U: 13FF (hex)

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; The files used in this assembly are:

ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH2D.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

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ZZ-ESKAM-V132 Subroutines
ESKAM2E.MCR

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SEQ 0614
Page

:1 .NOLIST
:1804 .LIST
:1805

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:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      *
:1809      FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1816      6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      R[OF] AND DO A RETURN.
:1819
:1820      IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      TO THE CONSOLE.
:1823
:1824      -
U 1100, 0000,003C,1980,0800,0084,7003 :1825      1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001 :1826      1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001 :1827      1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001 :1828      1103: SC_K[.3],J/TRPH0      : TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001 :1829      1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001 :1830      1105: SC_K[.6],J/TRPH0      : TB MISS
U 1106, 0000,003C,D980,0800,0084,7001 :1831      1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001 :1832      1107: SC_K[.7],J/TRPH0      : TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001 :1833      1108: SC_K[.8],J/TRPH0      : CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003 :1834      110C: SC_K[.C],J/TRPH1      : RDS
U 110D, 0000,003C,8980,0800,0084,7003 :1835      110D: SC_K[.D],J/TRPH1      : TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001 :1836      110E: SC_K[.10],J/TRPH0      : ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003 :1837      110F: SC_K[.F],J/TRPH1      : CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F :1838      TRPH0: Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B :1839      Q_D,D,Q
U 105B, 0000,003C,8180,3C00,0000,105F :1840      ID[USTACK],D
U 105F, 0C00,003C,01E0,0800,0000,1109 :1841      Q_D,D,Q
U 1109, 0000,003C,01C0,0A78,0000,1154 :1842      Q-R[OF]
U 1154, 0001,2024,0180,0800,0010,11B0 :1843      ALU_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
U 11B0, 0000,013C,0180,0800,0000,1002 :1844      Z?      : BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000 :1845      =0      ALU_Q.AND.MASK,R[OF],ALU,RETURN0 : CLEAR THE BIT AND RETURN
:1846      *
:1847      THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      FAULT STATUS REGISTER
:1854      SBI ERROR REGISTER
:1855      TIMEOUT ADDRESS REGISTER
:1856      MAINTENANCE REGISTER
:1857      CACHE PARITY REGISTER
:1858      TB ERROR REGISTER 1
:1859      TB ERROR REGISTER 0
:1860      -

```


U 1003, 0018,0038,1D80,09E8,0000,104C :1861
U 104C, 0000,003D,D980,0800,0084,71D2 :1862
U 104D, 0000,003C,49F0,2C00,0000,11B1 :1863
U 11B1, 0001,203C,4DF0,2DB0,0000,11B2 :1864
U 11B2, 0001,203C,65F0,2DB8,0000,11B3 :1865
U 11B3, 0001,203C,6DF0,2DD8,0000,11B4 :1866
U 11B4, 0001,203C,75F0,2DE0,0000,11B5 :1867
U 11B5, 0001,203C,79F0,2DC8,0000,11B6 :1868
U 11B6, 0001,203C,69F0,2DC0,0000,11B7 :1869
U 11B7, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,11CC :1871

U 11B8, 0000,003C,65F8,0800,0084,71B9 :1880
U 11B9, 0818,0038,8D80,0800,0000,11BA :1881
U 11BA, 0D00,003C,0180,0800,0000,11BB :1882
U 11BB, 0000,003C,3D80,3C00,0000,11BC :1883
U 11BC, 0818,0038,0580,0800,0000,11BD :1884
U 11BD, 0D00,003C,0180,0800,0000,11BE :1885
U 11BE, 0F00,003C,3180,3C00,0000,11BF :1886
U 11BF, 0000,003C,5D80,3C00,0000,11C0 :1887
U 11C0, 0000,003C,3980,3C00,0000,11C1 :1888
U 11C1, 0000,003C,2980,3C00,0000,11C2 :1889
U 11C2, 0000,003C,4980,3C00,0000,11C3 :1890
U 11C3, 0818,0038,C180,0800,0000,11C4 :1891
U 11C4, 0000,003C,6580,3C00,0000,11C5 :1892
U 11C5, 0F00,003C,6D80,3C00,0000,11C6 :1893
U 11C6, 0000,003C,6D80,3C00,0000,11C7 :1894
U 11C7, 0000,003C,6580,3C00,0000,11C8 :1895
U 11C8, 0003,003C,0180,09F0,0000,11C9 :1896
U 11C9, 0003,003C,0180,0AF8,0000,11CA :1897
U 11CA, 0003,003C,0180,09E8,0000,105E :1898
U 11CB, 0818,0038,0980,0800,0000,105E :1899
U 11CC, 0810,0038,0180,0978,0000,11CD :1900
U 11CD, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 11CE, 0810,0038,0180,0978,0000,11CF :1903
U 11CF, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905

U 105E, 0000,003C,1D80,3C00,0000,105E :1906

U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6]_Q,Q_ID[TBER1]
RC[7]_Q,Q_ID[SBI.ERR]
RC[0B]_Q,Q_ID[FAULT]
RC[0C]_Q,Q_ID[MAINT]
RC[9]_Q,Q_ID[PARITY]
RC[8]_Q,Q_ID[TIME.ADDR]
RC[0A]_Q,Q_ID[USTACK]
1000: RC[0E]_Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWST
ERLOOP
ERROR1
ERROR2

SCOPE: SC_K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_K[.1F] : ...
D-DAL.SC
ID[PSL]_D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.CS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.CS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D

RC[0E]_0
RC[0F]_0
RC[0D]_0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]

D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:

CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

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U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,11D0 :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 11D0, 0810,0038,4D80,0978,0000,11D1 :1936
U 11D1, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 11D2, 0010,0038,01C0,0978,0000,11D3 :1943
U 11D3, 0019,2034,4DC0,0800,0000,11D4 :1944
U 11D4, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
:1948
:1949
U 11D5, 0018,0038,C180,0800,0000,11D6 :1950
U 11D6, 0500,003C,0380,0800,0000,1058 :1951
U 1058, 0000,003D,0180,0800,0000,11E8 :1952
U 1059, 0000,003C,0180,0800,0000,105C :1953
U 105C, 0000,003D,0180,0800,0000,11E9 :1954
U 105D, 0000,003E,0180,0800,0000,0001 :1955
:1956
U 11D7, 0118,0038,1B80,0800,0000,11EB :1957
U 11D8, 0118,0038,0B80,0800,0000,11EB :1958
U 11D9, 0118,0038,0780,0800,0000,11EB :1959
U 11DA, 0118,0038,C380,0800,0000,11EB :1960
U 11DB, 0018,0038,1980,0800,0000,11D7 :1961
U 11DC, 0018,0038,1980,0800,0000,11D8 :1962
U 11DD, 0018,0038,1980,0800,0000,11D9 :1963
U 11DE, 0018,0038,1980,0800,0000,11DA :1964
U 11DF, 0018,0038,0980,0800,0000,11D7 :1965
U 11E0, 0018,0038,0980,0800,0000,11D8 :1966
U 11E1, 0018,0038,0980,0800,0000,11D9 :1967
U 11E2, 0018,0038,0980,0800,0000,11DA :1968
U 11E3, 0018,0038,0580,0800,0000,11D7 :1969
U 11E4, 0018,0038,0580,0800,0000,11D8 :1970

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13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP
:
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:
SUBTST: D RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1
:
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:
SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1
:
: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.
DC.1DE: ALU_K[.FFFF]
D D.LEFT,S1/7
=0 CALL,J/DCD
NOP
=0 CALL,J/DCE
RETURN1
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
S00: ALU_0(K),D D.LEFT2,S1/7,J/SX
S01: ALU_K[.2],D D.LEFT2,S1/7,J/SX
S10: ALU_K[.1],D D.LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D D.LEFT2,S1/7,J/SX
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01

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U 11E5, 0018,0038,0580,0800,0000,11D9 :1971 DCA: ALU_K[.1],J/S10
U 11E6, 0018,0038,0580,0800,0000,11DA :1972 DCB: ALU_K[.1],J/S11
U 11E7, 0018,0038,C180,0800,0000,11D7 :1973 DCC: ALU_K[.FFFF],J/S00
U 11E8, 0018,0038,C180,0800,0000,11D8 :1974 DCD: ALU_K[.FFFF],J/S01
U 11E9, 0018,0038,C180,0800,0000,11D9 :1975 DCE: ALU_K[.FFFF],J/S10
U 11EA, 0018,0038,C180,0800,0000,11DA :1976 DCF: ALU_K[.FFFF],J/S11
U 11EB, 0100,003E,0380,0800,0000,0001 :1977 SX: D_D.LEFT2,SI/7,RETURN1
U 11EC, 0018,0038,01C0,0800,0000,106C :1978 DC.5: Q_K[.8]
:1979 =0
U 106C, 0000,003D,0180,0800,0000,11E0 :1980 DC.5A: CALL,J/DC5
U 106D, 0019,2000,05C0,0800,0010,11ED :1981 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11ED, 0000,013C,0180,0800,0000,106E :1982 Z?
U 106E, 0000,003C,0180,0800,0000,106C :1983 =0
U 106F, 0000,003E,0180,0800,0000,0001 :1984 J/DC.5A
:1985 RETURN1
U 1070, 0000,003D,0180,0800,0000,11EC :1986 DC.A: CALL,J/DC.5
U 1071, 0500,003E,0180,0800,0000,0001 :1987 D_D.LEFT,SI/ZERO,RETURN1
U 11EE, 0018,0038,01C0,0800,0000,1072 :1988 DC.9: Q_K[.8]
:1989 =0
U 1072, 0000,003D,0180,0800,0000,11E4 :1990 DC.9A: CALL,J/DC9
U 1073, 0019,2000,05C0,0800,0010,11EF :1991 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11EF, 0000,013C,0180,0800,0000,1074 :1992 Z?
U 1074, 0000,003C,0180,0800,0000,1072 :1993 =0
U 1075, 0000,003E,0180,0800,0000,0001 :1994 J/DC.9A
:1995 RETURN1
U 1076, 0000,003D,0180,0800,0000,11EE :1996 DC.C: CALL,J/DC.9
U 1077, 0018,0038,C180,0800,0000,11F0 :1997 ALU_K[.FFFF]
U 11F0, 0600,003E,0380,0800,0000,0001 :1998 D_D.RIGHT,SI/7,RETURN1
:1999 =0
U 1078, 0000,003D,0180,0800,0000,11EE :2000 DC.6: CALL,J/DC.9
U 1079, 0018,0038,0580,0800,0000,11F1 :2001 ALU_K[.1]
U 11F1, 0100,003E,0380,0800,0000,0001 :2002 D_D.LEFT2,SI/7,RETURN1
:2003 =0
U 107A, 0000,003D,0180,0800,0000,11EE :2004 DC.3: CALL,J/DC.9
U 107B, 0018,0038,C180,0800,0000,11F2 :2005 ALU_K[.FFFF]
U 11F2, 0500,003E,0380,0800,0000,0001 :2006 D_D.LEFT,SI/7,RETURN1
:2007 ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
:2008 ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE IB
:2009 ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 11F3, 0000,003F,0180,0800,0000,117C :2010 TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001 :2011 117C: RETURN1
U 117D, 0000,003E,0180,0800,0000,0002 :2012 117D: RETURN2
U 117E, 0000,003E,0180,0800,0000,0003 :2013 117E: RETURN3
U 117F, 0000,003E,0180,0800,0000,0004 :2014 117F: RETURN4
U 11FC, 0000,003D,0180,0800,0000,11CC :2015 11FC: ERROR1
U 11FD, 0000,003D,0180,0800,0000,11CC :2016 11FD: ERROR1
U 11FE, 0000,003D,0180,0800,0000,11CC :2017 11FE: ERROR1
U 11FF, 0000,003D,0180,0800,0000,11CC :2018 11FF: ERROR1
:2019 ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.
U 11F4, 0F18,0038,5DC0,0800,0000,107C :2020 DCLA: D_0,Q_K[.7]
:2021 =0
U 107C, 0000,003D,0180,0800,0000,11E5 :2022 DCLA1: CALL,J/DCA
U 107D, 0001,203C,0180,0800,0010,11F5 :2023 ALU_Q,CLK.UBCC
U 11F5, 0000,013C,0180,0800,0000,107E :2024 Z?
U 107E, 0019,2000,05C0,0800,0000,107C :2025 =0
Q_Q-K[.1],J/DCLA1

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U 107F, 0000,003E,0180,0800,0000,0001 :2026
:2027 RETURN1
:2028 ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
:2029 ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
:2030 ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
:2031 ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
:2032 ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
:2033 ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
:2034 ; WILL CONTAIN THE READ DATA.
:2035 =0
U 1080, 0F00,003D,0180,0800,0000,11E1 :2035 RHOM1: D 0,CALL,J/DC6
U 1081, 0000,003C,0180,0800,0000,1087 :2036 J7READ
:2037 =0
U 1082, 0F00,003D,0180,0800,0000,11DD :2038 RHOM1: D 0,CALL,J/DC2
U 1083, 0000,003C,0180,0800,0000,1087 :2039 J7READ
:2040 =0
U 1084, 0F00,003D,0180,0800,0000,11DF :2041 RMOM1: D 0,CALL,J/DC4
U 1085, 0000,003C,0180,0800,0000,1087 :2042 J7READ
:2043 =0
U 1086, 0F00,003C,0180,0800,0000,1087 :2044 RMOM1: D 0,J/READ
U 1087, 0000,003C,01F8,0800,0084,71F6 :2045 READ: ST K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
U 11F6, 0D00,003C,0180,0800,0000,11F7 :2046 D DAL,SC
U 11F7, 0001,003C,0180,09E8,0000,11F8 :2047 RC[OD] D
U 11F8, 0818,0038,6180,0800,0084,71F9 :2048 D K[.F],SC K[.F] ; CALCULATE THE EXPECTED FORCE MISS
U 11F9, 0000,003C,09F8,0800,0084,81FA :2049 ST SC-K[.2],Q 0 ; AND FORCE REPLACE BITS
U 11FA, 0D00,003C,75F0,2C00,0000,11FB :2050 D DAL,SC,Q ID[MAINT]
U 11FB, 001D,0034,01C0,0800,0000,1200 :2051 ACU D[AND]Q,Q_ALU
U 1200, 0810,0038,0180,0968,0000,1201 :2052 D RC[OD]
U 1201, 001D,0030,0180,09E8,0000,1202 :2053 ACU D[OR]Q,RC[OD],ALU
U 1202, 0000,003C,0180,0A70,0000,1203 :2054 LAB R[OE]
U 1203, 0000,003C,0180,52F8,0000,1204 :2055 R[OF] LA,FS/MCT,MCT/READ.V.WCHK
U 1204, 0001,003C,0180,09D0,0000,1205 :2056 RC[OA] D
U 1205, 0000,003C,75F0,2C00,0000,1206 :2057 Q ID[MAINT]
U 1206, 0800,003C,0180,0A78,0000,1207 :2058 D R[OF]
U 1207, 0003,003C,0180,0AF8,0000,1208 :2059 R[OF] 0
U 1208, 0001,203C,0180,09E0,0000,1209 :2060 RC[OC] Q
U 1209, 0000,003C,01C0,0A70,0000,120A :2061 Q R[OE]
U 120A, 0001,003C,0180,09C8,0000,120B :2062 RC[9] D
U 120B, 001D,2000,0180,0800,0010,120C :2063 ALU_Q=D,CLK.UBCC
U 120C, 0000,013C,0180,0800,0000,1088 :2064 Z?
U 1088, 0000,003C,0180,0800,0000,1214 :2065 =0 J/RERR
U 1089, 0818,0038,D5F8,0800,0000,120D :2066 Q 0,D,K[.6]
U 120D, 0000,003C,0180,0800,0084,720E :2067 ST K[.8]
U 120E, 0D10,0038,01C0,0960,0000,120F :2068 D DAL,SC,Q RC[OC]
U 120F, 001D,2034,01C0,0800,0000,1210 :2069 ACU Q[AND]Q,Q_ALU
U 1210, 0810,0038,0180,0968,0000,1211 :2070 D RC[OD]
U 1211, 0819,0034,9180,0800,0000,1212 :2071 ACU D[AND]K[.1F00],D_ALU ; AND OUT EVERYTHING BUT HIT/MISS BITS
U 1212, 001D,2000,0180,0800,0010,1213 :2072 ALU_Q=D,CLK.UBCC
U 1213, 0010,0138,01C0,0958,0000,108A :2073 Z?,Q RC[OB]
U 108A, 0000,003E,0180,0800,0000,0002 :2074 =0 RETURN2
U 108B, 0810,003A,0180,0950,0000,0003 :2075 D RC[OA],RETURN3
U 1214, 0000,003C,79F0,2C00,0000,1215 :2076 RERR: Q ID[PARITY]
U 1215, 0001,203E,0180,09E8,0000,0001 :2077 RC[OD] Q,RETURN1
:2078 ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
:2079 ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
:2080 ; ELSE RETURN2.

```



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U 1216, 0000,003C,0180,0A70,0000,1217 :2081
U 1217, 0000,003C,0180,32F8,0000,1218 :2082
U 1218, 0800,003C,0180,0A78,0000,1219 :2083
U 1219, 0003,003C,0180,0AF8,0000,121A :2084
U 121A, 0000,003C,01C0,0A70,0000,121B :2085
U 121B, 001D,2000,0180,0800,0010,121C :2086
U 121C, 0000,013C,0180,0800,0000,108C :2087
U 108C, 0000,003C,0180,0800,0000,1214 :2088
U 108D, 0000,003E,0180,0800,0000,0002 :2089
:2090
:2091
:2092
:2093
:2094
U 121D, 0F00,003C,0180,0800,0000,121E :2095
U 121E, 0000,003C,8580,0800,0084,721F :2096
U 121F, 0801,001C,0180,0800,0000,1220 :2097
U 1220, 0000,003E,7580,3C00,0000,0001 :2098
:2099
U 1221, 0F00,003C,0180,0800,0000,1222 :2100
U 1222, 0000,003C,6180,0800,0084,7223 :2101
U 1223, 0000,003C,0580,0800,0084,8224 :2102
U 1224, 0801,001C,0180,0800,0000,121E :2103
:2104
U 1225, 0F00,003C,0180,0800,0000,1226 :2105
U 1226, 0000,003C,8980,0800,0084,7224 :2106
:2107
U 1227, 0F00,003C,0180,0800,0000,1228 :2108
U 1228, 0000,003C,6580,0800,0084,7224 :2109
:2110
U 1229, 0F00,003C,0180,0800,0000,122A :2111
U 122A, 0000,003C,6180,0800,0084,7224 :2112
:2113
U 122B, 0F00,003C,0180,0800,0000,122C :2114
U 122C, 0000,003C,6180,0800,0084,722D :2115
U 122D, 0801,001C,0180,0800,0000,1228 :2116
:2117
U 122E, 0F00,003C,0180,0800,0000,122F :2118
U 122F, 0000,003C,6180,0800,0084,7230 :2119
U 1230, 0801,001C,0180,0800,0000,1222 :2120
:2121
U 1231, 0F00,003C,8980,0800,0084,722D :2122
:2123
:2124
:2125
:2126
:2127
:2128
:2129
:2130
:2131
:2132
:2133
U 1232, 0F18,0038,5DC0,0800,0000,108E :2134
:2135

```

```

WRITE: LAB R[OE]
      R[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
      D R[OF]
      R[OF] 0
      Q R[OE]
      ACU_Q-D,CLK.UBCC
      ??
=0    J/RERR          : UTRAPPED.
      RETURN2         : OK NO UTRAP.
: THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
: REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
: CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
: NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
: DISSABLE SBI CYCLES:
SOFF: D 0
S1:   SC K[C]
      ALD D,ORNOT.MASK,D,ALU
      ID[MAINT] D,RETURN
: SET FORCE REPLACE GROUP ZERO BIT
ROS:  D 0
S2:   SC K[F]
      SC SC-K[.1]
S3:   ALD D,ORNOT.MASK,D,ALU,J/S1
: SET FORCE REPLACE GROUP 1 BIT
R1S:  D 0
S4:   SC K[D],J/S3
: SET FORCE MISS GROUP 0 BIT
MOS:  D 0
S5:   SC K[.10],J/S3
: SET FORCE MISS GROUP 1 BIT
M1S:  D 0
S6:   SC K[F],J/S3
: SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
M1OS: D 0
      SC K[F]
S7:   ALD D,ORNOT.MASK,D,ALU,J/S5
: SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
ROM1S: D 0
      SC K[F]
      ALD D,ORNOT.MASK,D,ALU,J/S2
: SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
R1MOS: D 0,SC K[D],J/S7
: THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
: PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
: THESE PATTERNS IN THE RC SCRATCH PADS.
:2126  RC[0]  AAAAAAAA
:2127  RC[1]  19999000
:2128  RC[2]  55555555
:2129  RC[3]  06666000
:2130  RC[4]  99999999
:2131  RC[5]  186DB000
:2132  RC[6]  66666666
:2133  RC[7]  04924000
CAPAT: Q_K[.7],D_0
=0

```

U 108E.	0000	003D	0180	0800	0000	11E5	:2136
U 108F.	0001	203C	0180	0800	0010	1233	:2137
U 1233.	0000	013C	0180	0800	0000	1090	:2138
U 1090.	0019	2000	05C0	0800	0000	108E	:2139
U 1091.	0001	003C	0180	0980	0000	1234	:2140
U 1234.	0001	0028	0180	0990	0000	1235	:2141
U 1235.	0F18	0038	5DC0	0800	0000	1092	:2142
U 1092.	0000	003D	0180	0800	0000	11E4	:2143
U 1093.	0001	203C	0180	0800	0010	1236	:2144
U 1236.	0000	013C	0180	0800	0000	1094	:2145
U 1094.	0019	2000	05C0	0800	0000	1092	:2146
U 1095.	0001	003C	0180	09A0	0000	1237	:2147
U 1237.	0001	0028	0180	0980	0000	1238	:2148
U 1238.	0000	003C	89F8	0800	0084	7239	:2149
U 1239.	0D00	003C	0180	0800	0000	123A	:2150
U 123A.	0600	003C	0180	0800	0000	123B	:2151
U 123B.	0001	003C	0180	0988	0000	123C	:2152
U 123C.	0810	0038	65F8	0930	0084	723D	:2153
U 123D.	0D00	003C	0180	0800	0000	123E	:2154
U 123E.	0200	003C	0180	0800	0000	123F	:2155
U 123F.	0200	003C	0180	0800	0000	1240	:2156
U 1240.	0F01	003C	0180	0998	0000	1096	:2157
U 1096.	0000	003D	0180	0800	0000	11E4	:2158
U 1097.	0100	003C	0180	0800	0000	1098	:2159
U 1098.	0000	003D	0180	0800	0000	11E4	:2160
U 1099.	0500	003C	0180	0800	0000	109A	:2161
U 109A.	0000	003D	0180	0800	0000	11DF	:2162
U 109B.	0001	0028	0180	09A8	0000	1241	:2163
U 1241.	0000	003C	85F8	0800	0084	7242	:2164
U 1242.	0D00	003C	0180	0800	0000	1243	:2165
U 1243.	0001	003C	0180	0988	0000	1244	:2166
U 1244.	0810	0038	0180	0928	0000	1245	:2167
U 1245.	0000	003C	61F8	0800	0084	7246	:2168
U 1246.	0D00	003C	0180	0800	0000	1247	:2169
U 1247.	0200	003C	0180	0800	0000	1248	:2170
U 1248.	0600	003C	0180	0800	0000	1249	:2171
U 1249.	0001	003E	0180	09A8	0000	0001	:2172

```

CAP1: CALL,J/DCA
      ALU_Q,CLK.UBCC
      Z?
=0    Q_Q-K[.1],J/CAP1
      RC[0] D
      ALU_NOT.D,RC[2]_ALU
      Q_K[.7],D_0
=0
CAP2: CALL,J/DC9
      ALU_Q,CLK.UBCC
      Z?
=0    Q_Q-K[.1],J/CAP2
      RC[4] D
      ALU_NOT.D,RC[6]_ALU
      Q_0,SC_K[.D]
      D_DAL.SC
      D_D.RIGHT,S1/ZERO
      RC[1] D
      D_RC[8],SC_K[.10],Q_0
      D_DAL.SC
      D_D.RIGHT2,S1/ZERO
      D_D.RIGHT2,S1/ZERO
      RC[3] D,D_0
=0    CALL,J/DC9
      D_D.LEFT2,S1/ZERO
=0    CALL,J/DC9
      D_D.LEFT,S1/ZERO
=0    CALL,J/DC4
      ALU_NOT.D,RC[5]_ALU
      SC_RC[.C],Q_0
      D_DAL.SC
      RC[7] D
      D_RC[5]
      SC_K[.F],Q_0
      D_DAL.SC
      D_D.RIGHT2,S1/ZERO
      D_D.RIGHT,S1/ZERO
      RC[5] D,RETURN1

```

[illegible]

```

:2174 .PAGE "TEST D6 GROUP 1 HIT/MISS COMPARATORS TEST"
:2175 *****
:2176 ++
:2177 TEST D6 GROUP 1 HIT MISS COMPARATORS TEST
:2178
:2179 TEST DESCRIPTION
:2180 THIS IS A TEST OF THE HIT MISS COMPARATORS OF GROUP ONE.
:2181
:2182 LOGIC DESCRIPTION
:2183 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2184 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2185 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2186 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2187 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2188 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2189 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2190 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2191 REGISTER ON THE SBI CONTROL MODULE.
:2192
:2193 ERROR DESCRIPTION
:2194 ADDRESS WHICH SHOULD BE A HIT IN GROUP 1
:2195 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2196 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE BITS
:2197 ARE RELEVANT)
:2198 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2199 UTRAP OCCURS
:2200 GOT CACHE MAINT REGISTER
:2201 EXPECTED READ DATA
:2202 GOT READ DATA
:2203 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2204 FLAG UTRAP TYPE
:2205 ----
:2206 1DE NO UTRAP OCCURRED
:2207 DE CACHE PARITY UTRAP
:2208 15E TB PARITY ERROR
:2209 19E TB MISS
:2210 1CE TB PROTECTION ERROR
:2211 1D6 TB MODIFY BIT ERROR
:2212 1DA X PAGE UTRAP
:2213 1DC UNALIGNED DATA UTRAP
:2214 ADDRESS REFERENCED
:2215
:2216 --
:2217 *****
:2218 =0
:2219 COMG1: NEWTST
:2220 D 0,RC[0F] K[.7]
:2221 =0 CALL J/DC.TDE ; GENERATE UTRAP FLAG
:2222 RC[0E]_D
:2223 D 0
:2224 =0 ID[TBRO] D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
:2225 VA K[ZERO] ; INVALIDATE LOCATION 0
:2226 FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
:2227 =0 CALL J/ROS ; SET FORCE REPLACE GROUP 0 BIT
:2228 VA_RC[1] ; VA=19999000
    
```

```

U 109C, 0000,003D,0180,0800,0000,11B8
U 109D, 0F18,0038,5D80,09F8,0000,109E
U 109E, 0000,003D,0180,0800,0000,11D5
U 109F, 0001,003C,0180,0AF0,0000,124A
U 124A, 0F00,003C,0180,0800,0000,10A0
U 10A0, 0000,003D,4980,3C00,0000,1232
U 10A1, 0018,0038,1980,0800,0200,124B
U 124B, 0000,003C,0180,9000,0000,10A2
U 10A2, 0000,003D,0180,0800,0000,1221
U 10A3, 0010,0038,0180,0908,0200,124C
    
```


U 124C.	0810,0038,0180,0900,0000,124D	:2229	D RC[0]	: DATA=AAAAAAAA
U 124D.	0000,003C,0180,9800,0000,10A4	:2230	FS/MCT,MCT/VALIDATE	: WRITE GROUP 0
U 10A4.	0000,003D,0180,0800,0000,1225	:2231	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 10A5.	0010,0038,0180,0918,0200,124E	:2232	VA RC[3]	: VA=06666000
U 124E.	0810,0038,0180,0910,0000,124F	:2233	D RC[2] ; DATA=55555555	
U 124F.	0000,003C,0180,9800,0000,10A6	:2234	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 10A6.	0000,003D,0180,0800,0000,121D	:2235	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 10A7.	0018,0038,6580,0A80,0000,1250	:2236	R[0] K[10]	: INITIALIZE A COUNTER
U 1250.	0000,003C,6180,0800,0084,7251	:2237	SC K[F]	: GENERATE AN ADDRESS MASK
U 1251.	0803,0010,0180,0800,0000,1252	:2238	ALU MASK+1,D ALU	
U 1252.	0200,003C,0180,0800,0000,1253	:2239	D D.RIGHT2,SI/ZERO	
U 1253.	0600,003C,0180,0800,0000,1254	:2240	D D.RIGHT,SI/ZERO	
U 1254.	0001,003C,0180,0A88,0000,10A8	:2241	R[1] D	: R[1]=1FFFE000
U 10A8.	0000,003D,0180,0800,0000,11CB	:2242	ERLOOP	
U 10A9.	0800,003C,0180,0A00,0000,1255	:2243	COMG1A: D RC[0]	: GENERATE TEST PATTERNS OF
U 1255.	0018,0038,85C0,0800,0000,1256	:2244	Q K[C]	: TAG= 1 IN 0'S AND TAG= 0 IN 1'S
U 1256.	001D,2014,0180,0A90,0082,1257	:2245	ALU Q+D,SC ALU,R[2] ALU	
U 1257.	0800,0024,0180,0A08,0000,1258	:2246	ALU R[1].ANDNOT.MASK,D ALU	
U 1258.	0001,003C,0180,0A98,0000,1259	:2247	R[3] D	
U 1259.	0800,0034,0180,0A08,0000,125A	:2248	ALU R[1].AND.MASK,D ALU	
U 125A.	0001,003C,0180,0AA0,0000,10AA	:2249	R[4] D	
U 10AA.	0000,003D,0180,0800,0000,1225	:2250	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 10AB.	0018,0038,1980,09F0,0200,125B	:2251	VA K[ZERO],RC[0E] ALU	: MAKE 0 A HIT IN GROUP 1
U 125B.	0810,0038,0180,0920,0000,125C	:2252	D RC[4]	: DATA=99999999
U 125C.	0000,003C,0180,9800,0000,10AC	:2253	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 10AC.	0000,003D,0180,0800,0000,121D	:2254	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 10AD.	0800,003C,0180,0A18,0200,125D	:2255	VA R[3],D_R[3]	: REFERENCE 1 IN 0'S ADDRESS PATTERN
U 125D.	0001,003C,0180,09C0,0000,1004	:2256	RC[8] D ; WHILE 0	: IS A HIT
U 1004.	0000,003D,0180,0800,0000,1086	:2257	CALL J/RMOM1	: 1 IN 0'S PATTERN SHOULD BE A MISS
U 1005.	0000,003D,0180,0800,0000,11CC	:2258	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 1006.	0000,003D,0180,0800,0000,11CC	:2259	ERROR1	: HIT/MISS BITS INCORRECT
U 1007.	0018,0038,1980,09C0,0200,125E	:2260	VA K[ZERO],RC[8] ALU	: REFERENCE 0
U 125E.	0010,0038,01C0,0920,0000,1008	:2261	Q RC[4]	
U 1008.	0001,203D,0180,09D8,0000,1084	:2262	CALL J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT
U 1009.	0000,003D,0180,0800,0000,11CC	:2263	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 100A.	0000,003D,0180,0800,0000,11CC	:2264	ERROR1	: HIT/MISS BITS INCORRECT
U 100B.	001D,2000,0180,0800,0010,125F	:2265	ALU Q-D,CLK.UBCC	: DATA AT 0 SHOULD BE=99999999
U 125F.	0000,013C,0180,0800,0000,10AE	:2266	Z?	
U 10AE.	0000,003D,0180,0800,0000,11CC	:2267	ERROR1	: DATA INCORRECT
U 10AF.	0000,003C,0180,0800,0000,10B0	:2268	NOP	
U 10B0.	0000,003D,0180,0800,0000,1225	:2269	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 10B1.	0800,003C,0180,0A18,0200,1260	:2270	VA R[3],D_R[3]	: MAKE 1 IN 0'S ADDRESS PATTERN
U 1260.	0001,003C,0180,09F0,0000,1261	:2271	RC[0E] D	: A HIT IN GROUP 1
U 1261.	0810,0038,0180,0930,0000,1262	:2272	D RC[6]	: DATA=66666666
U 1262.	0000,003C,0180,9800,0000,10B2	:2273	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 10B2.	0000,003D,0180,0800,0000,121D	:2274	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 10B3.	0018,0038,1980,09C0,0200,100C	:2275	VA K[ZERO],RC[8] ALU	: REFERENCE 0 WITH
		:2276		: 1 IN 0'S PATTERN A HIT
U 100C.	0000,003D,0180,0800,0000,1086	:2277	CALL J/RMOM1	: 0 SHOULD BE A MISS
U 100D.	0000,003D,0180,0800,0000,11CC	:2278	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 100E.	0000,003D,0180,0800,0000,11CC	:2279	ERROR1	: HIT/MISS BITS INCORRECT
U 100F.	0800,003C,0180,0A18,0200,1263	:2280	VA R[3],D_R[3]	: REFERENCE 1 IN 0'S PATTERN
U 1263.	0001,003C,0180,09C0,0000,1264	:2281	RC[8] D	
U 1264.	0010,0038,01C0,0930,0000,1010	:2282	Q RC[8]	
U 1010.	0001,203D,0180,09D8,0000,1084	:2283	CALL J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT IN GROUP 1

U 1011.	0000,003D,0180,0800,0000,11CC	:2284	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 1012.	0000,003D,0180,0800,0000,11CC	:2285	ERROR1	: HIT/MISS BITS INCORRECT
U 1013.	001D,2000,0180,0800,0010,1265	:2286	ALU_Q-D,CLK.UBCC	: DATA SHOULD BE 66666666
U 1265.	0000,013C,0180,0800,0000,10B4	:2287	Z?	
U 10B4.	0000,003D,0180,0800,0000,11CC	:2288	ERROR1	: DATA INCORRECT
U 10B5.	0000,003C,0180,0800,0000,10B6	:2289	NOP	
U 10B6.	0000,003D,0180,0800,0000,1225	:2290	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 10B7.	0800,003C,0180,0A08,0200,1266	:2291	VA_R[1],D_R[1]	: MAKE ADDRESS 1FFFE000 A HIT IN GROUP 1
U 1266.	0001,003C,0180,09F0,0000,1267	:2292	RC[0E] D	
U 1267.	0810,0038,0180,0920,0000,1268	:2293	D RC[4]	: DATA=99999999
U 1268.	0000,003C,0180,9800,0000,10B8	:2294	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 10B8.	0000,003D,0180,0800,0000,121D	:2295	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 10B9.	0800,003C,0180,0A20,0200,1269	:2296	VA_R[4],D_R[4]	: REFERENCE ADDRESS PATTERN=0 IN 1'S
U 1269.	0001,003C,0180,09C0,0000,1014	:2297	RC[8] D	
U 1014.	0000,003D,0180,0800,0000,10B6	:2298	CALL J/RMOM1	: SHOULD BE A MISS
U 1015.	0000,003D,0180,0800,0000,11CC	:2299	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 1016.	0000,003D,0180,0800,0000,11CC	:2300	ERROR1	: HIT/MISS BITS INCORRECT
U 1017.	0800,003C,0180,0A08,0200,126A	:2301	VA_R[1],D_R[1]	: REFERENCE 1FFFE000
U 126A.	0001,003C,0180,09C0,0000,126B	:2302	RC[8] D	
U 126B.	0010,0038,01C0,0920,0000,1018	:2303	Q RC[4]	
U 1018.	0001,203D,0180,09D8,0000,10B4	:2304	CALL J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT
U 1019.	0000,003D,0180,0800,0000,11CC	:2305	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 101A.	0000,003D,0180,0800,0000,11CC	:2306	ERROR1	: HIT/MISS BITS INCORRECT
U 101B.	001D,2000,0180,0800,0010,126C	:2307	ALU_Q-D,CLK.UBCC	: DATA SHOULD BE 99999999
U 126C.	0000,013C,0180,0800,0000,10BA	:2308	Z?	
U 10BA.	0000,003D,0180,0800,0000,11CC	:2309	ERROR1	: DATA INCORRECT
U 10BB.	0000,003C,0180,0800,0000,10BC	:2310	NOP	
U 10BC.	0000,003D,0180,0800,0000,1225	:2311	CALL J/R1S	: SET FORCE REPLACE GROUP 1 BIT
U 10BD.	0800,003C,0180,0A20,0200,126D	:2312	VA_R[4],D_R[4]	: MAKE 0 IN 1'S ADDRESS PATTERN A HIT
U 126D.	0001,003C,0180,09F0,0000,126E	:2313	RC[0E] D	
U 126E.	0810,0038,0180,0930,0000,126F	:2314	D RC[6]	: DATA=66666666
U 126F.	0000,003C,0180,9800,0000,10BE	:2315	FS/MCT,MCT/VALIDATE	: WRITE GROUP 1
U 10BE.	0000,003D,0180,0800,0000,121D	:2316	CALL J/SOFF	: CLEAR FORCE REPLACE BITS
U 10BF.	0800,003C,0180,0A08,0200,1270	:2317	VA_R[1],D_R[1]	: REFERENCE ADDRESS 1FFFE000
U 1270.	0001,003C,0180,09C0,0000,101C	:2318	RC[8] D	: WHILE 0 IN 1'S PATTERN IS A HIT
U 101C.	0000,003D,0180,0800,0000,10B6	:2319	CALL J/RMOM1	: 1FFFE000 SHOULD BE A MISS
U 101D.	0000,003D,0180,0800,0000,11CC	:2320	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 101E.	0000,003D,0180,0800,0000,11CC	:2321	ERROR1	: HIT/MISS BITS INCORRECT
U 101F.	0800,003C,0180,0A20,0200,1271	:2322	VA_R[4],D_R[4]	: REFERENCE 0 IN 1'S PATTERN
U 1271.	0001,003C,0180,09C0,0000,1272	:2323	RC[8] D	
U 1272.	0010,0038,01C0,0930,0000,1020	:2324	Q RC[6]	
U 1020.	0001,203D,0180,09D8,0000,10B4	:2325	CALL J/RMOM1,RC[0B]_Q	: SHOULD BE A HIT
U 1021.	0000,003D,0180,0800,0000,11CC	:2326	ERROR1	: UNEXPECTED UTRAP OCCURRED
U 1022.	0000,003D,0180,0800,0000,11CC	:2327	ERROR1	: HIT/MISS BITS INCORRECT
U 1023.	001D,2000,0180,0800,0010,1273	:2328	ALU_Q-D,CLK.UBCC	: DATA SHOULD BE 66666666
U 1273.	0000,013C,0180,0800,0000,10C0	:2329	Z?	
U 10C0.	0000,003D,0180,0800,0000,11CC	:2330	ERROR1	: DATA INCORRECT
U 10C1.	0000,003C,0180,0800,0000,1274	:2331	NOP	
U 1274.	0000,003C,0180,0A00,0010,1275	:2332	ALU_RE0],CLK.UBCC	: TRIED ALL PATTERNS?
U 1275.	0000,013C,0180,0800,0000,10C2	:2333	Z?	
U 10C2.	0018,0000,0580,0A80,0000,10A9	:2334	R[0] LA-K[.1],J/COMG1A	: IF NOT CONTINUE
U 10C3.	0810,0038,0180,0908,0200,1276	:2335	VA_R[1],D_R[1]	: CHECK HIT AT 19999000 IN GROUP
U 1276.	0001,003C,0180,09F0,0000,1277	:2336	RC[0E] D	: 0
U 1277.	0001,003C,0180,09C0,0000,1278	:2337	RC[8] D	
U 1278.	0010,0038,01C0,0900,0000,1024	:2338	Q_RC[0]	

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ESKAH2E.MCR MICRO2 1M(01) 16-DEC-82 11:51:27

SEQ 0625
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U 1024.	0001,203D,0180,09D8,0000,1082	:2339	=00	CALL,J/RHOM1,RC[OB]_Q	
U 1025.	0000,003D,0180,0800,0000,11CC	:2340		ERROR1	: UNEXPECTED UTRAP OCCURRED
U 1026.	0000,003D,0180,0800,0000,11CC	:2341		ERROR1	: HIT/MISS BITS INCORRECT
U 1027.	001D,2000,0180,0800,0010,1279	:2342		ALU_Q-D,CLK.UBCC	: DATA SHOULD BE AAAAAAAAAA
U 1279.	0000,013C,0180,0800,0000,10C4	:2343		Z?	
U 10C4.	0000,003D,0180,0800,0000,11CC	:2344	=0	ERROR1	: DATA INCORRECT
U 10C5.	0000,003C,0180,0800,0000,10C6	:2345		NOP	

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:2346 .PAGE 'TEST D7 ADDRESS PARITY LOGIC TEST'
:2347 *****
:2348 **
:2349 TEST D7 ADDRESS PARITY LOGIC TEST
:2350
:2351 TEST DESCRIPTION
:2352 THIS IS A TEST OF THE PARITY ERROR DETECTION LOGIC ON THE
:2353 CAM AND SBI BOARDS. THE MAINTENANCE FEATURES OF THE SBI
:2354 MAINTENANCE REGISTER ARE USED TO FORCE PARITY ERRORS
:2355 AT EACH ADDRESS PARITY CHECKER. AFTER EACH ERROR THE PARITY
:2356 ERROR REGISTER IS CHECKED TO MAKE SURE THAT A CORRECT INDICATION
:2357 OF WHAT HAPPENED IS PRESENTED.
:2358
:2359 LOGIC DESCRIPTION
:2360 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2361 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2362 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2363 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2364 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2365 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2366 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2367 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2368 REGISTER ON THE SBI CONTROL MODULE.
:2369
:2370 ERROR DESCRIPTION
:2371 VA REFERENCED
:2372 DATA WRITTEN
:2373 EXPECTED CACHE PARITY REGISTER, ID[PARITY]
:2374 GOT CACHE PARITY REGISTER, ID[PARITY]
:2375 WROTE CACHE MAINTENANCE REGISTER
:2376 GOT CACHE MAINT REGISTER
:2377 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2378 FLAG UTRAP TYPE
:2379 ----
:2380 1DE NO UTRAP OCCURRED
:2381 DE CACHE PARITY UTRAP
:2382 15E TB PARITY ERROR
:2383 19E TB MISS
:2384 1CE TB PROTECTION ERROR
:2385 1D6 TB MODIFY BIT ERROR
:2386 1DA X PAGE UTRAP
:2387 1DC UNALIGNED DATA UTRAP
:2388 ERROR CODE: (FOR FAILCHAIN)
:2389 0=> ID [MAINT] INCORRECT
:2390 1=> ID[PARITY] INCORRECT
:2391 2=> PARITY SIGNALS OR PARITY UTRAP DECODE LOGIC FAILURES
:2392
:2393 --
:2394 *****
:2395 =0
:2396 APARO: NEWTST
:2397 D 0,RC[0F] K[.8]
:2398 =0 ID[TBRO]_B,CALL,J/CAPAT ; TB OFF, GET TEST PATTERNS
:2399 NOP
:2400 =0 CALL,J/SOFF ; TURN OFF SBI CYCLES

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U 10C6, 0000,003D,0180,0800,0000,11B8
U 10C7, 0F18,0038,0180,09F8,0000,10C8
U 10C8, 0000,003D,4980,3C00,0000,1232
U 10C9, 0000,003C,0180,0800,0000,10CA
U 10CA, 0000,003D,0180,0800,0000,121D

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U 10CB, 0F18,0038,1980,0800,0200,127A :2401 VA K[ZERO],D 0 : INVALIDATE LOCATIO 0
U 127A, 0000,003C,0180,9000,0000,10CC :2402 FS7MCT,MCT/INVALIDATE : OF BOTH GROUPS
U 10CC, 0F00,003D,0180,0800,0000,11D5 :2403 =0 D 0,CALL,J/DC.1DE : GET UTRAP FLAG
U 10CD, 0001,003C,0180,0AF0,0000,127B :2404 R[OE] D
U 127B, 0003,003C,0180,0AF8,0000,127C :2405 R[OF] 0
U 127C, 0818,0038,D5F8,0800,0000,127D :2406 D K[8],Q 0
U 127D, 0000,003C,0180,0800,0084,727E :2407 SC K[8]
U 127E, 0D00,003C,0180,0800,0000,127F :2408 D DAL.SC
U 127F, 0001,003C,0180,0A98,0000,10CE :2409 R[3] D : R[3]=600, USED AS MAINT REG. MASK
U 10CE, 0F00,003D,0180,0800,0000,11F4 :2410 =0 D 0,CALL,J/DCLA : GENERATE ADDRESS WHICH
U 10CF, 0000,003C,65F8,0800,0084,7280 :2411 SC K[10],Q 0 : WILL BE A HIT IN BOTH
U 1280, 0D00,003C,0180,0800,0000,1281 :2412 D DAL.SC : GROUPS WHEN THE REFERENCE
U 1281, 0200,003C,0180,0800,0000,1282 :2413 D D.RIGHT2,SI/ZERO : WHICH WILL CAUSE A PARITY ERROR IS MADE
U 1282, 0200,003C,0180,0800,0000,1283 :2414 D D.RIGHT2,SI/ZERO
U 1283, 0001,003C,0180,0988,0000,10D0 :2415 R[7] D : RC[7]=0AAAA000 TEST ADDRESS
U 10D0, 0000,003D,0180,0800,0000,1221 :2416 =0 CALL,J/ROS : SET FORCE REPLACE GROUP 0 BIT
U 10D1, 0810,0038,0180,0938,0200,1284 :2417 VA RC[7],D_RC[7] : ; VA=0AAAA000
U 1284, 0001,003C,0180,09F0,0000,1285 :2418 R[OE] D
U 1285, 0810,0038,0180,0920,0000,1286 :2419 D RC[4] : DATA=99999999
U 1286, 0001,003C,0180,09E8,0000,1287 :2420 R[OD] D
U 1287, 0000,003C,0180,9800,0000,10D2 :2421 FS/MCT,MCT/VALIDATE : WRITE ADDRESS 0AAAA000 INTO GROUP 0
U 10D2, 0000,003D,0180,0800,0000,1231 :2422 =0 CALL,J/RIMOS : SET FORCE MISS TO 0 AND REPLACE GROUP 1 BITS
U 10D3, 0010,0038,0180,0938,0200,1288 :2423 VA RC[7] : MAKE 0AAAA000 A HIT IN GROUP 1
U 1288, 0810,0038,0180,0920,0000,1289 :2424 D RC[4] : DATA=99999999
U 1289, 0000,003C,0180,9800,0000,10D4 :2425 FS/MCT,MCT/VALIDATE : WRITE GROUP 1
U 10D4, 0000,003D,0180,0800,0000,121D :2426 =0 CALL,J/SOFF : CLEAR FORCE REPLACE AND FORCE MISS BITS
U 10D5, 0818,0038,1180,0800,0000,128A :2427 D K[4]
U 128A, 0019,0014,0580,0A80,0000,128B :2428 A[U D+K[1],R[0]_ALU : INITIALIZE A COUNT, R[0]=5
U 128B, 0000,003C,6580,0800,0084,728C :2429 SC K[10] : GENERATE SOME CONSTANTS USED IN THE TEST
U 128C, 0000,003C,0580,0800,0084,928D :2430 SC SC+K[1]
U 128D, 0803,001C,8580,0A80,0084,728E :2431 ALU NOT.MASK,D ALU,R[6] ALU,SC_K[C]
U 128E, 0001,001C,0180,0A88,0000,128F :2432 ALU D.ORNOT.MASK,R[7]_ALU
U 128F, 0018,0038,0980,0A88,0000,1290 :2433 R[1] K[2]
U 1290, 0018,0038,C180,0AC0,0000,10D6 :2434 R[8] K[FFFF]
U 10D6, 0000,003D,0180,0800,0000,11CB :2435 =0 ERLOOP
U 10D7, 0F03,003C,0180,09D0,0000,1291 :2436 APAR1: D 0,RC[0A] 0
U 1291, 0000,003C,7580,3C00,0000,1292 :2437 ID[MAINT] D : TRY TO CLEAR THE MAINT REGISTER
U 1292, 0000,003C,75F0,2C00,0000,1293 :2438 Q ID[MAINT] : READ THE MAINT REGISTER AND
U 1293, 0001,203C,0180,09C8,0000,1294 :2439 R[9] Q
U 1294, 000D,2024,0180,0A18,0010,1295 :2440 LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC : SEE IF IT WAS CLEARED.
U 1295, 0000,013C,0180,0800,0000,10D8 :2441 Z?
U 10D8, 0003,003D,0180,0988,0000,11CC :2442 =0 ERROR1,RC[7]_0 : ID[MAINT] INCORRECT
U 10D9, 0818,0038,4580,0800,0000,1296 :2443 D K[8000]
U 1296, 0000,003C,7980,3C00,0000,1297 :2444 ID[PARITY] D : TRY TO CLEAR THE PARITY REGISTER
U 1297, 0600,003C,0180,0800,0000,1298 :2445 D D.RIGHT,SI/ZERO
U 1298, 0001,003C,79F0,2DE0,0000,1299 :2446 R[OC] D,Q ID[PARITY] : READ THE PARITY REGISTER
U 1299, 0001,203C,0180,09D8,0000,129A :2447 R[OB] Q
U 129A, 001D,2000,0180,0800,0010,129B :2448 ALU_Q-D,CLK.UBCC : SEE IF THE PARITY REGISTER CLEARED.
U 129B, 0000,013C,0180,0800,0000,10DA :2449 Z?
U 10DA, 0018,0039,0580,0988,0000,11CC :2450 =0 ERROR1,RC[7]_K[1] : ID[PARITY] INCORRECT
U 10DB, 0800,003C,0180,0A38,0000,129C :2451 D R[7]
U 129C, 0001,003C,0180,09D0,0000,129D :2452 R[OA] D
U 129D, 0000,003C,7580,3C00,0000,129E :2453 ID[MAINT] D : SET THE FORCE ERROR BITS IN ID[MAINT]
U 129E, 0000,003C,75F0,2C00,0000,129F :2454 Q ID[MAINT] : READ MAINT REGISTER BACK
U 129F, 0001,203C,0180,09C8,0000,12A0 :2455 R[9] Q

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U 12A0, 000D,2024,01C0,0A18,0000,12A1 :2456 LAB_R[3],ALU_Q[ANDNOT]LB,Q ALU
U 12A1, 001D,2000,0180,0800,0010,12A2 :2457 ALU_Q-D,CLK.UBCC ; SEE IF FORCE ERROR BITS CORRECT
U 12A2, 0000,013C,0180,0800,0000,10DC :2458 Z?
U 10DC, 0003,003D,0180,09B8,0000,11CC :2459 =0 ERROR1,RC[7]_0 ; ID[MAINT] INCORRECT
U 10DD, 0800,003C,0180,0A40,0000,12A3 :2460 D_R[8]
U 12A3, 0000,003C,0180,0A08,0082,12A4 :2461 SC_R[1]
U 12A4, 0801,0034,0180,09E0,0000,12A5 :2462 ALU_D.AND.MASK,D_ALU,RC[0C] ALU
U 12A5, 0018,0038,1980,0800,0200,12A6 :2463 VA_R[ZERO] ; SET VA=0
U 12A6, 0000,003C,0180,0A70,0000,12A7 :2464 LAB_R[0E] ; INITIALIZE UTRAP FLAG
U 12A7, 0000,003C,0180,0AF8,0000,12A8 :2465 RC[0F] LA
U 12A8, 0000,003C,0180,5000,0000,12A9 :2466 FS/MCT,MCT/READ.V.WCHK ; SHOULD UTRAP BECAUSE OF
:2467 ; CACHE PARITY ERROR.
:2468 ; SEE IF UTRAP OCCURRED
U 12A9, 0800,003C,0180,0A78,0000,12AB :2468 D_RC[0F]
U 12AB, 0003,003C,0180,0AF8,0000,12AC :2469 RC[0F] 0
U 12AC, 0000,003C,01C0,0A70,0000,12AD :2470 Q_RC[0E]
U 12AD, 0001,003C,0180,09C0,0000,12AE :2471 RC[8] D
U 12AE, 001D,2000,0180,0800,0010,12AF :2472 ALU_Q-D,CLK.UBCC
U 12AF, 0000,013C,0180,0800,0000,10DE :2473 Z?
U 10DE, 0000,003C,0180,0800,0000,12B0 :2474 =0 J/APAR2
U 10DF, 0018,0039,0980,09B8,0000,11CC :2475 ERROR1,RC[7]_K[2] ; NO UTRAP
U 12B0, 0000,003C,0180,0800,0084,72B1 :2476 APAR2: SC_K[8] ; SEE IF UTRAP WAS CACHE PARITY UTRAP
U 12B1, 0001,0024,0180,0800,0010,12B2 :2477 ALU_D.ANDNOT.MASK,CLK.UBCC
U 12B2, 0000,013C,0180,0800,0000,10E0 :2478 Z?
U 10E0, 0018,0039,0580,09B8,0000,11CC :2479 =0 ERROR1,RC[7]_K[1] ; UTRAPPED BUT NOT CACHE PARITY
U 10E1, 0000,003C,79F0,2C00,0000,12B3 :2480 Q_ID[PARITY] ; GET CACHE PARITY REGISTER
U 12B3, 0001,203C,0180,09D8,0000,12B4 :2481 RC[0B] Q
U 12B4, 0810,0038,0180,0960,0000,12B5 :2482 D_RC[0C]
U 12B5, 001D,2000,0180,0800,0010,12B6 :2483 ALU_Q-D,CLK.UBCC ; WAS PARITY REGISTER CORRECT?
U 12B6, 0000,013C,0180,0800,0000,10E2 :2484 Z?
U 10E2, 0018,0039,0980,09B8,0000,11CC :2485 =0 ERROR1,RC[7]_K[2] ; ID[PARITY] INCORRECT
U 10E3, 0F03,003C,0180,09D0,0000,12B7 :2486 D_0,RC[0A] 0
U 12B7, 0000,003C,7580,3C00,0000,12B8 :2487 ID[MAINT] 0 ; CLEAR MAINT FORCE PARITY ERROR BITS
U 12B8, 0000,003C,75F0,2C00,0000,12B9 :2488 Q_ID[MAINT] ; READ MAINT REGISTER AND SEE IF IT IS CLEAR
U 12B9, 0001,203C,0180,09C8,0000,12BA :2489 RC[9] Q
U 12BA, 000D,2024,0180,0A18,0010,12BB :2490 LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC
U 12BB, 0000,013C,0180,0800,0000,10E4 :2491 Z?
U 10E4, 0003,003D,0180,09B8,0000,11CC :2492 =0 ERROR1,RC[7]_0 ; ID[MAINT] INCORRECT
U 10E5, 0818,0038,4580,0800,0000,12BC :2493 D_K[8000]
U 12BC, 0000,003C,7980,3C00,0000,12BD :2494 ID[PARITY] 0 ; CLEAR PARITY REGISTER
U 12BD, 0600,003C,0180,0800,0000,12BE :2495 D_D.RIGHT,S1/ZERO
U 12BE, 0001,003C,79F0,2DE0,0000,12BF :2496 RC[0C]_D,Q_ID[PARITY] ; READ PARITY REGISTER
U 12BF, 0001,203C,0180,09D8,0000,12C0 :2497 RC[0B] Q
U 12C0, 001D,2000,0180,0800,0010,12C1 :2498 ALU_Q-D,CLK.UBCC
U 12C1, 0000,013C,0180,0800,0000,10E6 :2499 Z?
U 10E6, 0018,0039,0580,09B8,0000,11CC :2500 =0 ERROR1,RC[7]_K[1] ; ID[PARITY] INCORRECT
U 10E7, 0000,003C,0180,0A08,0010,12C2 :2501 ALU_R[1],CLK.UBCC
U 12C2, 0000,013C,0180,0800,0000,10E8 :2502 Z?
U 10E8, 0018,0000,0580,0A88,0000,12C4 :2503 =0 R[1]_LA-K[1],J/APAR3
U 10E9, 0818,0038,1180,0800,0000,12C3 :2504 D_K[4]
U 12C3, 0019,0014,0580,0A88,0000,12C4 :2505 ALU_D+K[1],R[1]_ALU
U 12C4, 0800,003C,0180,0A30,0000,12C5 :2506 APAR3: D_R[6] ; GENERATE NEW DATA FOR NEXT TEST
U 12C5, 0000,003C,01C0,0A38,0000,12C6 :2507 Q_R[7]
U 12C6, 001D,2014,0180,0A88,0000,12C7 :2508 ALU_Q+D,R[7]_ALU
U 12C7, 0000,003C,0180,0A00,0010,12C8 :2509 ALU_R[0],CLK.UBCC ; ARE ALL ADDRESS PARITY CHECKERS TESTED?
U 12C8, 0000,013C,0180,0800,0000,10EA :2510 Z?

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:2513 .PAGE "TEST D8 DATA PARITY LOGIC TEST"
:2514 *****
:2515 ++
:2516 TEST D8 DATA PARITY LOGIC TEST
:2517
:2518 TEST DESCRIPTION
:2519 THIS IS A TEST OF THE CACHE DATA MEMORY PARITY ERROR
:2520 DETECTION LOGIC. A PARITY ERROR IS FORCED AT
:2521 EACH PARITY CHECKER USING THE MAINTENANCE FEATURES OF THE
:2522 SBI MAINTENANCE REGISTER. A MICRO TRAP WILL
:2523 RESULT AND THE APPROPRIATE BITS SHOULD GET SET IN THE
:2524 SBI PARITY ERROR REGSIETR.
:2525
:2526 LOGIC DESCRIPTION
:2527 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2528 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2529 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2530 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2531 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2532 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2533 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2534 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2535 REGISTER ON THE SBI CONTROL MODULE.
:2536
:2537 ERROR DESCRIPTION
:2538 VA REFERENCED
:2539 DATA WRITTEN
:2540 EXPECTED CACHE PARITY REGISTER, ID[PARITY]
:2541 GOT CACHE PARITY REGISTER, ID[PARITY]
:2542 WROTE CACHE MAINTENANCE REGISTER
:2543 GOT CACHE MAINT REGISTER
:2544 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2545 FLAG UTRAP TYPE
:2546 ----
:2547 1DE NO UTRAP OCCURRED
:2548 DE CACHE PARITY UTRAP
:2549 15E TB PARITY ERROR
:2550 19E TB MISS
:2551 1CE TB PROTECTION ERROR
:2552 1D6 TB MODIFY BIT ERROR
:2553 1DA X PAGE UTRAP
:2554 1DC UNALIGNED DATA UTRAP
:2555 ERROR CODE: (FOR FAILCHAIN)
:2556 0=>ID[MAINT] REGISTER INCORRECT
:2557 1=>ID[PARITY] REGISTER INCORRECT
:2558 2=> PARITY SIGNALS OR PARITY UTRAP DECODE LOGIC FAILURES
:2559
:2560 --
:2561 *****
:2562 =0
:2563 DPARO: NEWTST
:2564 D 0,RC[OF] K[.8]
:2565 =0 ID[1BERO]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST DATA PATTERNS
:2566 NOP
:2567 =0 CALL,J/SOFF ; TURN SBI CYCLES OFF

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U 10EC, 0000,003D,0180,0800,0000,11B8
U 10ED, 0F18,0038,0180,09F8,0000,10EE
U 10EE, 0000,003D,4980,3C00,0000,1232
U 10EF, 0000,003C,0180,0800,0000,10F0
U 10F0, 0000,003D,0180,0800,0000,121D

U 10F1, 0F18,0038,1980,0800,0200,12C9 :2568
U 12C9, 0000,003C,0180,9000,0000,10F2 :2569
U 10F2, 0F00,003D,0180,0800,0000,11D5 :2570
U 10F3, 0001,003C,0180,0AF0,0000,12CA :2571
U 12CA, 0003,003C,0180,0AF8,0000,12CB :2572
U 12CB, 0F18,0038,11C0,0800,0000,10F4 :2573
U 10F4, 0000,003D,0180,0800,0000,11E5 :2574
U 10F5, 0000,003C,0180,0800,0000,10F6 :2575
U 10F6, 0000,003D,0180,0800,0000,11E8 :2576
U 10F7, 0001,203C,0180,0800,0010,12CC :2577
U 12CC, 0000,013C,0180,0800,0000,10F8 :2578
U 10F8, 0019,2000,05C0,0800,0000,10F4 :2579
U 10F9, 0001,003C,0180,0980,0000,12CD :2580
U 12CD, 0818,0038,0580,0800,0000,12CE :2581
U 12CE, 0000,003C,01F8,0800,0084,72CF :2582
U 12CF, 0D00,003C,0180,0800,0000,12D0 :2583
U 12D0, 0001,003C,0180,0A98,0000,10FA :2584
U 10FA, 0000,003D,0180,0800,0000,1221 :2585
U 10FB, 0810,0038,0180,0938,0200,12D1 :2586
U 12D1, 0001,003C,0180,09F0,0000,12D2 :2587
U 12D2, 0810,0038,0180,0930,0000,12D3 :2588
U 12D3, 0001,003C,0180,09E8,0000,12D4 :2589
U 12D4, 0000,003C,0180,9800,0000,10FC :2590
U 10FC, 0000,003D,0180,0800,0000,1231 :2591
U 10FD, 0010,0038,0180,0938,0200,12D5 :2592
U 12D5, 0810,0038,0180,0930,0000,12D6 :2593
U 12D6, 0000,003C,0180,9800,0000,10FE :2594
U 10FE, 0000,003D,0180,0800,0000,121D :2595
U 10FF, 0018,0038,0580,0A80,0000,12D7 :2596
U 12D7, 0018,0038,0580,0A88,0000,12D8 :2597
U 12D8, 0000,003C,0580,0800,0084,72D9 :2598
U 12D9, 0000,003C,0580,0800,0084,92DA :2599
U 12DA, 0803,001C,0D80,0A80,0084,92DB :2600
U 12DB, 0803,001C,0580,0800,0084,72DC :2601
U 12DC, 0001,001C,0180,0A88,0000,12DD :2602
U 12DD, 0018,0038,0180,0AC0,0000,110A :2603
U 110A, 0000,003D,0180,0800,0000,11CB :2604
U 110B, 0F03,003C,0180,09D0,0000,12DE :2605
U 12DE, 0000,003C,7580,3C00,0000,12DF :2606
U 12DF, 0000,003C,75F0,2C00,0000,12E0 :2607
U 12E0, 0001,203C,0180,09C8,0000,12E1 :2608
U 12E1, 000D,2024,0180,0A18,0010,12E2 :2609
U 12E2, 0000,013C,0180,0800,0000,1110 :2610
U 1110, 0003,003D,0180,0988,0000,11CC :2611
U 1111, 0818,0038,4580,0800,0000,12E3 :2612
U 12E3, 0000,003C,7980,3C00,0000,12E4 :2613
U 12E4, 0600,003C,0180,0800,0000,12E5 :2614
U 12E5, 0001,003C,79F0,2DE0,0000,12E6 :2615
U 12E6, 0001,203C,0180,09D8,0000,12E7 :2616
U 12E7, 0010,2000,0180,0800,0010,12E8 :2617
U 12E8, 0000,013C,0180,0800,0000,1112 :2618
U 1112, 0018,0039,0580,0988,0000,11CC :2619
U 1113, 0800,003C,0180,0A38,0000,12E9 :2620
U 12E9, 0001,003C,0180,09D0,0000,12EA :2621

```

VA_K[ZERO],D_0      ; INVALDATE LOCATION 0
FS7MCT,MCT/INVALIDATE ; BOTH GROUPS
D_0,CALL,J/DC.1DE    ; GENERATE UTRAP FLAG
RC[0E],D
RC[0F],D
Q_K[.4],D_0          ; GENERATE A DATA PATTERN WHICH
                        ; WHEN WRITTEN INTO THE CACHE DATA
                        ; MEMORY CAN BE USED WITH THE
                        ; MAINTENANCE FUNCTION TO FORCE PARITY ERRORS.
DPAR05: CALL,J/DCA
NOP
CALL,J/DCD
ALU_Q,CLK.UBCC
Z?
Q_Q-K[.1],J/DPAR05
RC[06],D              ; DATA PATTERN=RC[06]=ADADADAD
D_K[.6]
Q_Q,SC_K[.8]
D-DAL.SC
RC[3],D               ; R[3]=600, A MASK USED TO TEST ID[MAINT]
CALL,J/ROS            ; SET FORCE REPLACE GROUP 0 BIT
VA_RC[7],D_RC[7]      ; VA=04924000
RC[0E],D
D_RC[6]               ; DATA=ADADADAD
RC[0D],D
FS/MCT,MCT/VALIDATE  ; WRITE GROUP 0
CALL,J/RIMOS          ; SET FORCE MISS GROUP 0 AND REPLACE GROUP 1 BITS
VA_RC[7]              ; VA=04924000
D_RC[6]               ; DATA=ADADADAD
FS/MCT,MCT/VALIDATE  ; WRITE GROUP 1
CALL,J/SOFF           ; CLEAR FORCE REPLACE AND FORCE MISS BITS.
RC[0],K[.A]           ; GENERATE SOME CONSTANTS USED IN THE TEST
RC[1],K[.7]           ; INITIALIZE A COUNTER
SC_K[.10]
SC-SC+K[.1]
ALU_NOT.MASK,D_ALU,RC[6],ALU,SC-SC+K[.3]
ALU_NOT.MASK,D_ALU,SC_K[.C]
ALU-D.ORNOT.MASK,RC[7],ALU
RC[8],K[.FFFF]
ERLOOP
DPAR1: D_0,RC[0A],D
ID[MAINT],D           ; TRY TO CLEAR THE MAINT REGISTER
Q_ID[MAINT]           ; READ THE MAINTENANCE REGISTER
RC[9],D
LAB_RC[3],ALU_Q[ANDNOT]LB,CLK.UBCC ; IS IT CLEAR?
Z?
ERROR1,RC[7],D_0      ; ID[MAINT] INCORRECT
D_K[.8000]
ID[PARITY],D          ; TRY TO CLEAR THE PARITY ERROR REGISTER
D-D.RIGHT,S1/ZERO
RC[0C],D,Q_ID[PARITY] ; READ THE PARITY REGISTER.
RC[0B],D
ALU_Q-D,CLK.UBCC      ; IS IT CLEAR?
Z?
ERROR1,RC[7],K[.1]    ; ID[PARITY] INCORRECT
D_RC[7]
RC[0A],D

```


U 12EA.	0000,003C,7580,3C00,0000,12EB	:2623	ID[MAINT] D	: SET FORCE PARITY ERROR BITS.
U 12EB.	0000,003C,75F0,2C00,0000,12EC	:2624	Q ID[MAINT]	: SEE IF BITS GOT SET.
U 12EC.	0001,203C,0180,09C8,0000,12ED	:2625	RC[9] Q	
U 12ED.	0000,2024,01C0,0A18,0000,12EE	:2626	LAB_R[3],ALU_Q[ANDNOT]LB,Q ALU	
U 12EE.	001D,2000,0180,0800,0010,12EF	:2627	ALU_Q-D,CLK.UBCC	: ARE FORCE ERROR BITS CORRECT.
U 12EF.	0000,013C,0180,0800,0000,1114	:2628	Z?	
U 1114.	0003,003D,0180,09B8,0000,11CC	:2629	ERROR1,RC[7]_0	: ID[MAINT] INCORRECT
U 1115.	0800,003C,0180,0A40,0000,12F0	:2630	D RC[8]	
U 12F0.	0000,003C,0180,0A00,0082,12F1	:2631	SC RC[0]	
U 12F1.	0801,0034,0180,09E0,0000,12F2	:2632	ALU_D.AND.MASK,D_ALU,RC[0C] ALU	
U 12F2.	0018,0038,1980,0800,0200,12F3	:2633	VA RC[ZERO]	: READ LOCATION 0
U 12F3.	0000,003C,0180,0A70,0000,12F4	:2634	LAB RC[0E]	: SET UP UTRAP FLAG
U 12F4.	0000,003C,0180,0AF8,0000,12F5	:2635	RC[0F] LA	
U 12F5.	0000,003C,0180,5000,0000,12F6	:2636	FS/MCT,MCT/READ.V.WCHK	: THIS REFERENCE TO LOCATION 0 SHOULD
		:2637		: RESULT IN A CACHE DATA PARITY ERROR.
U 12F6.	0800,003C,0180,0A78,0000,12F7	:2638	D RC[0F]	: SEE IF UTRAP OCCURRED
U 12F7.	0003,003C,0180,0AF8,0000,12F8	:2639	RC[0F]_0	
U 12F8.	0001,003C,0180,09C0,0000,12F9	:2640	RC[8]_D	
U 12F9.	0000,003C,01C0,0A70,0000,12FA	:2641	Q RC[0E]	
U 12FA.	001D,2000,0180,0800,0010,12FB	:2642	ALU_Q-D,CLK.UBCC	
U 12FB.	0000,013C,0180,0800,0000,1116	:2643	Z?	
U 1116.	0000,003C,0180,0800,0000,12FC	:2644	J/DPAR2	
U 1117.	0018,0039,0980,09B8,0000,11CC	:2645	ERROR1,RC[7]_K[.2]	: NO UTRAP.
U 12FC.	0000,003C,0180,0800,0084,72FD	:2646	DPAR2: SC K[.8]	: SEE IF THIS UTRAP WAS BECAUSE OF A CACHE PARITY ER
U 12FD.	0001,0024,0180,0800,0010,12FE	:2647	ALU_D.ANDNOT.MASK,CLK.UBCC	
U 12FE.	0000,013C,0180,0800,0000,1118	:2648	Z?	
U 1118.	0018,0039,0580,09B8,0000,11CC	:2649	ERROR1,RC[7]_K[.1]	: UTRAPPED BUT NOT CACHE PARITY ERROR
U 1119.	0000,003C,79F0,2C00,0000,12FF	:2650	Q ID[PARITY]	: GET PARITY ERROR REGISTER
U 12FF.	0001,203C,0180,09D8,0000,1300	:2651	RC[0B] Q	
U 1300.	0810,0038,0180,0960,0000,1301	:2652	D RC[0C]	
U 1301.	001D,2000,0180,0800,0010,1302	:2653	ALU_Q-D,CLK.UBCC	: SEE IF CORRECT ERROR INDICATION GIVEN
U 1302.	0000,013C,0180,0800,0000,111A	:2654	Z?	
U 111A.	0018,0039,0980,09B8,0000,11CC	:2655	ERROR1,RC[7]_K[.2]	: ID[PARITY] INCORRECT
U 111B.	0F03,003C,0180,09D0,0000,1303	:2656	D 0,RC[0A] 0	
U 1303.	0000,003C,7580,3C00,0000,1304	:2657	ID[MAINT] D	: TRY TO CLEAR THE FORCE ERROR BITS.
U 1304.	0000,003C,75F0,2C00,0000,1305	:2658	Q ID[MAINT]	: READ MAINT REGISTER
U 1305.	0001,203C,0180,09C8,0000,1306	:2659	RC[9] Q	
U 1306.	0000,2024,0180,0A18,0010,1307	:2660	LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC	: CLEAR?
U 1307.	0000,013C,0180,0800,0000,111C	:2661	Z?	
U 111C.	0003,003D,0180,09B8,0000,11CC	:2662	ERROR1,RC[7]_0	: ID[MAINT] INCORRECT
U 111D.	0818,0038,4580,0800,0000,1308	:2663	D K[.8000]	
U 1308.	0000,003C,7980,3C00,0000,1309	:2664	ID[PARITY] D	: TRY TO CLEAR PARITY ERROR REGISTER.
U 1309.	0600,003C,0180,0800,0000,130A	:2665	D D.RIGHT,51/ZERO	
U 130A.	0001,003C,79F0,2DE0,0000,130B	:2666	RC[0C]_D,Q_ID[PARITY]	: GET PARITY REGISTER
U 130B.	0001,203C,0180,09D8,0000,130C	:2667	RC[0B]_Q	
U 130C.	001D,2000,0180,0800,0010,130D	:2668	ALU_Q-D,CLK.UBCC	: IS IT CLEAR
U 130D.	0000,013C,0180,0800,0000,111E	:2669	Z?	
U 111E.	0018,0039,0580,09B8,0000,11CC	:2670	ERROR1,RC[7]_K[.1]	: ID[PARITY] INCORRECT
U 111F.	0000,003C,0180,0A00,0000,130E	:2671	LAB RC[0]	
U 130E.	0018,0014,0580,0A80,0000,130F	:2672	RC[0] LA+K[.1]	: GENERATE DATA FOR NEXT TEST
U 130F.	0818,0038,6180,0A00,0000,1310	:2673	LAB_R[0],D K[.F]	
U 1310.	0000,0008,0180,0800,0010,1311	:2674	ALU_D[A-B-T]LB,CLK.UBCC	
U 1311.	0000,013C,0180,0800,0000,1120	:2675	Z?	
U 1120.	0000,003C,0180,0800,0000,1312	:2676	J/DPAR3	
U 1121.	0018,0038,0580,0A80,0000,1312	:2677	RC[0]_K[.6]	

ZZ-ESKAH-V132 TEST D8 DATA PARITY LOGIC TEST
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SEQ 0633
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U 1312, 0800,003C,0180,0A30,0000,1313 :2678
U 1313, 0000,003C,0180,0A38,0000,1314 :2679
U 1314, 0000,0014,0180,0AB8,0000,1315 :2680
U 1315, 0000,003C,0180,0A08,0010,1316 :2681
U 1316, 0000,013C,0180,0800,0000,1122 :2682
U 1122, 0018,0000,0580,0A88,0000,110B :2683
U 1123, 0000,003C,0180,0800,0000,1124 :2684

DPAR3: D R[6]
LAB_R[7]
ALU_D[A+B]LB,R[7]_ALU
ALU_R[1],CLK.UBCC ; TESTED EACH PARITY CHECKER?
Z?
=0 R[1]_LA-K[.1],J/DPAR1 ; IF NOT CONTINUE
NOP

ZZ
ES

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.PAGE 'TEST D9 FORCE MISS BIT AND PARITY ERROR TEST IN GROUP 0'

++
 TEST D9 GROUP 0 FORCE MISS BIT AND PARITY DISABLE TEST

TEST DESCRIPTION
 THIS IS A TEST OF THE CACHE GROUP ZERO FORCE MISS BIT'S
 ABILITY TO DISABLE PARITY ERROR UTRAPS.

LOGIC DESCRIPTION
 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
 REGISTER ON THE SBI CONTROL MODULE.

ERROR DESCRIPTION
 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:

FLAG	UTRAP TYPE
1DE	NO UTRAP OCCURRED
DE	CACHE PARITY UTRAP
15E	TB PARITY ERROR
19E	TB MISS
1CE	TB PROTECTION ERROR
1D6	TB MODIFY BIT ERROR
1DA	X PAGE UTRAP
1DC	UNALIGNED DATA UTRAP

--

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=0
GODPO: NEWTST
      D 0,RC[0F] K[.1]
=0      ID[1BER0]_D,CALL,J/CAPAT ; TB OFF, AND GET DATA PATTERNS FOR TEST.
      NOP
=0      CALL J/SOFF                ; TURN OFF SBI CYCLES.
      VA K[ZERO],D 0              ; INVALIDATE LOCATION 0
      FS7MCT,MCT/INVALIDATE      ; OF BOTH GROUPS
=0      D 0,CALL,J/DC.1DE         ; GENERATE THE UTRAP FLAG DATA
      R[0E] D
      R[0F] 0
=0      D 0,CALL,J/DCLA           ; GENERATE AN ADDRESS PATTERN
      SC K[.10],Q_0
      D_BAL.SC
      D-D.RIGHT2,S1/ZERO          ; WITH WHICH A PARITY ERROR
      D-D.RIGHT2,S1/ZERO          ; CAN BE FORCED
=0      R[5] D                    ; PATTERN=RC[5]=0AAAA000
      CALL J/ROS                  ; SET FORCE REPLACE GROUP 0 BIT
      VA RC[5]                   ; VA=05555000
      D_RC[4]                    ; DATA=99999999
  
```

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U 1124. 0000.003D.0180.0800.0000.11B8
U 1125. 0F18.0038.0580.09F8.0000.1126
U 1126. 0000.003D.4980.3C00.0000.1232
U 1127. 0000.003C.0180.0800.0000.1128
U 1128. 0000.003D.0180.0800.0000.121D
U 1129. 0F18.0038.1980.0800.0200.1317
U 1317. 0000.003C.0180.9000.0000.112A
U 112A. 0F00.003D.0180.0800.0000.11D5
U 112B. 0001.003C.0180.0AF0.0000.1318
U 1318. 0003.003C.0180.0AF8.0000.112C
U 112C. 0F00.003D.0180.0800.0000.11F4
U 112D. 0000.003C.65F8.0800.0084.7319
U 1319. 0D00.003C.0180.0800.0000.131A
U 131A. 0200.003C.0180.0800.0000.131B
U 131B. 0200.003C.0180.0800.0000.131C
U 131C. 0001.003C.0180.09A8.0000.112E
U 112E. 0000.003D.0180.0800.0000.1221
U 112F. 0010.0038.0180.0928.0200.131D
U 131D. 0810.0038.0180.0920.0000.131E
  
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U 131E, 0000,003C,0180,9800,0000,1130 :2740
U 1130, 0000,003D,0180,0800,0000,1225 :2741
U 1131, 0010,0038,0180,0938,0200,131F :2742
U 131F, 0810,0038,0180,0930,0000,1320 :2743
U 1320, 0000,003C,0180,9800,0000,1132 :2744
U 1132, 0F00,003D,0180,0800,0000,11E4 :2745
U 1133, 0000,003C,65F8,0800,0084,7321 :2746
U 1321, 0D00,003C,8580,0800,0084,7322 :2747
U 1322, 0801,001C,0180,0A80,0000,1323 :2748
U 1323, 0000,003C,7580,3C00,0000,1324 :2749
U 1324, 0000,003C,0180,0A70,0000,1325 :2750
U 1325, 0000,003C,0180,0AF8,0000,1326 :2751
U 1326, 0018,0038,1980,0800,0200,1327 :2752
U 1327, 0000,003C,0180,5000,0000,1328 :2753
                                     :2754
                                     :2755
                                     :2756
                                     :2757
U 1328, 0800,003C,0180,0A78,0000,1329 :2758
U 1329, 0003,003C,0180,0AF8,0000,132A :2759
U 132A, 0001,003C,0180,09F0,0000,132B :2760
U 132B, 0000,003C,01C0,0A70,0000,132C :2761
U 132C, 001D,2000,0180,0800,0010,132D :2762
U 132D, 0000,013C,0180,0800,0000,1134 :2763
U 1134, 0000,003C,0180,0800,0000,132E :2764
U 1135, 0000,003C,0180,0800,0000,1331 :2765
U 132E, 0000,003C,0180,0800,0084,732F :2766
U 132F, 0001,0024,0180,0800,0010,1330 :2767
U 1330, 0000,013C,0180,0800,0000,1136 :2768
U 1136, 0000,003D,0180,0800,0000,11CC :2769
U 1137, 0000,003D,0180,0800,0000,11CC :2770
U 1331, 0F00,003C,0180,0800,0000,1332 :2771
U 1332, 0000,003C,7580,3C00,0000,1138 :2772

                                     FS/MCT,MCT/VALIDATE : WRITE GROUP 0
                                     CALL,J/R1S : SET FORCE REPLACE GROUP 1 BIT
                                     VA R[7] : VA=04924000
                                     D R[6] : DATA=66666666
                                     FS/MCT,MCT/VALIDATE : WRITE GROUP 1
                                     D_0,CALL,J/DC9 : SET FORCE MISS GROUP 0 BIT,
                                     Q_0,SC_K[.10] : AND FORCE CACHE ADDRESS PARITY ERROR
                                     D-DAL.SC,SC_K[.C] : AT BYTE A OF GROUP 0
                                     A[U D.ORN0T.MASK,R[0],ALU,D_ALU : IN THE MAINT REGISTER
                                     ID[MAINT],D
                                     LAB R[OE] : SET UP UTRAP FLAG
                                     R[OF],LA
                                     VA K[ZERO]
                                     FS/MCT,MCT/READ.V.WCHK : THIS REFERENCE SHOULD NORMALLY
                                     : CAUSE A UTRAP BECAUSE OF A
                                     : CACHE PARITY ERROR, BUT
                                     : BECAUSE THE FORCE MISS BIT IS SET
                                     : NO UTRAP SHOULD OCCUR
                                     : SEE IF UTRAPPED.

                                     D R[OF]
                                     R[OF],0
                                     R[OE],D
                                     Q R[OE]
                                     A[U_Q-D,CLK.UBCC
                                     Z?
                                     J/GODP1 : UTRAPPED
                                     J/GODP2 : NO UTRAP.
                                     SC_K[.8] : SEE IF UTRAP WAS BECAUSE OF A CACHE PARITY ERROR
                                     ALU_D.ANDNOT.MASK,CLK.UBCC
                                     Z?
                                     ERROR1 : NON CACHE PARITY ERROR UTRAP
                                     ERROR1 : CACHE PARITY UTRAP OCCURRED.
                                     D_0 : CLEAR MAINT REGISTER
                                     ID[MAINT],D
  
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.2773 .PAGE 'TEST DA FORCE MISS BIT AND PARITY ERROR TEST IN GROUP 1'
 .2774 *****
 .2775 ++

.2776 TEST DA GROUP 1 FORCE MISS BIT AND PARITY DISABLE TEST
 .2777

.2778 TEST DESCRIPTION
 .2779 THIS IS A TEST OF THE CACHE GROUP ONE FORCE MISS BIT'S
 .2780 ABILITY TO DISABLE PARITY ERROR UTRAPS.
 .2781

.2782 LOGIC DESCRIPTION
 .2783 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
 .2784 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
 .2785 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
 .2786 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
 .2787 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
 .2788 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
 .2789 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
 .2790 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
 .2791 REGISTER ON THE SBI CONTROL MODULE.
 .2792

.2793 ERROR DESCRIPTION
 .2794 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
 .2795 FLAG UTRAP TYPE
 .2796 ----
 .2797 1DE NO UTRAP OCCURRED
 .2798 DE CACHE PARITY UTRAP
 .2799 1SE TB PARITY ERROR
 .2800 19E TB MISS
 .2801 1CE TB PROTECTION ERROR
 .2802 1D6 TB MODIFY BIT ERROR
 .2803 1DA X PAGE UTRAP
 .2804 1DC UNALIGNED DATA UTRAP
 .2805
 .2806 --
 .2807 *****
 .2808

.2809 =0
 .2810 G1DP0: NEWTST
 .2811 D 0,RC[0F] K[.1]
 .2812 =0 ID[1BER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
 .2813 NOP
 .2814 =0 CALL,J/SOFF ; TURN OFF SBI CYCLES
 .2815 VA K[ZERO],D 0 ; INVALIDATE LOCATION 0 IN
 .2816 FS7MCT,MCT/INVALIDATE ; BOTH GROUPS
 .2817 =0 D 0,CALL,J/DC.1DE ; GENERATE A CONSTANT FOR THR UTRAP FLAG
 .2818 R[0E]_D
 .2819 R[0F]_0
 .2820 =0 D 0,CALL,J/DCLA ; GENERATE AN ADDRESS PATTERN WHICH
 .2821 SC K[.10],Q_0 ; WHEN WRITTEN INTO THE
 .2822 D_DAL.SC ; CACHE CAN BE USED TO FORCE
 .2823 D_D.RIGHT2,S1/ZERO ; A CACHE PARITY ERROR.
 .2824 R[7] D ; PATTERN=RC[7]=0AAAA000
 .2825 =0 CALL,J/ROS ; SET THE FORCE REPLACE GROUP 0 BIT
 .2826 VA RC[5] ; VA=1B6DB000
 .2827 D_RC[4] ; DATA=99999999

U 1138, 0000,003D,0180,0800,0000,1188
 U 1139, 0F18,0038,0580,09F8,0000,113A
 U 113A, 0000,003D,4980,3C00,0000,1232
 U 113B, 0000,003C,0180,0800,0000,113C
 U 113C, 0000,003D,0180,0800,0000,121D
 U 113D, 0F18,0038,1980,0800,0200,1333
 U 1333, 0000,003C,0180,9000,0000,113E
 U 113E, 0F00,003D,0180,0800,0000,11D5
 U 113F, 0001,003C,0180,0AF0,0000,1334
 U 1334, 0003,003C,0180,0AF8,0000,1140
 U 1140, 0F00,003D,0180,0800,0000,11F4
 U 1141, 0000,003C,65F8,0800,0084,7335
 U 1335, 0D00,003C,0180,0800,0000,1336
 U 1336, 0200,003C,0180,0800,0000,1337
 U 1337, 0200,003C,0180,0800,0000,1338
 U 1338, 0001,003C,0180,0988,0000,1142
 U 1142, 0000,003D,0180,0800,0000,1221
 U 1143, 0010,0038,0180,0928,0200,1339
 U 1339, 0810,0038,0180,0920,0000,133A

Address	Instruction	Comment
U 133A	0000,003C,0180,9800,0000,1144	:2828 FS/MCT,MCT/VALIDATE ; WRITE GROUP 0
U 1144	0000,003D,0180,0800,0000,1225	:2829 CALL,J/R1S ; SET FORCE REPLACE GROUP 1 BIT
U 1145	0010,0038,0180,0938,0200,133B	:2830 VA RC[7] ; VA=0AAAA000
U 133B	0810,0038,0180,0930,0000,133C	:2831 D RC[6] ; DATA=66666666
U 133C	0000,003C,0180,9800,0000,1146	:2832 FS/MCT,MCT/VALIDATE ; WRITE GROUP 1
U 1146	0F00,003D,0180,0800,0000,11E0	:2833 D_O,CALL,J/DC5 ; SET FORCE MISS GROUP 0
U 1147	0000,003C,61F8,0800,0084,733D	:2834 Q_O,SC_K[F] ; AND FORCE PARITY ERROR IN ADDRESS
U 133D	0D00,003C,8580,0800,0084,733E	:2835 D-DAL,SC,SC_K[C] ; BYTE 0 OF GROUP 1 BITS
U 133E	0801,001C,0180,0A80,0000,133F	:2836 A[U D,ORNOT,MASK,R[0],ALU,D_ALU ; IN THE MAINT REGISTER
U 133F	0000,003C,7580,3C00,0000,1340	:2837 ID[MAINT],D
U 1340	0000,003C,0180,0A70,0000,1341	:2838 LAB R[OE] ; SET UP UTRAP FLAG
U 1341	0000,003C,0180,0AF8,0000,1342	:2839 R[OF],LA
U 1342	0018,0038,1980,0800,0200,1343	:2840 VA_K[ZERO]
U 1343	0000,003C,0180,5000,0000,1344	:2841 FS7MCT,MCT/READ.V.WCHK ; THIS REFERENCE WOULD NORMALLY
		:2842 ; RESULT IN A UTRAP
		:2843 ; BECAUSE OF A CACHE GROUP 1
		:2844 ; PARITY ERROR, BUT BECAUSE THE
		:2845 ; FORCE MISS BIT FOR GROUP 1 IS
		:2846 ; SET NO UTRAP SHOULD OCCUR.
		:2847 ; SEE IF A UTRAP OCCURRED
U 1344	0800,003C,0180,0A78,0000,1345	:2847 D R[OF]
U 1345	0003,003C,0180,0AF8,0000,1346	:2848 R[OF],O
U 1346	0001,003C,0180,09F0,0000,1347	:2849 RC[OE],D
U 1347	0000,003C,01C0,0A70,0000,1348	:2850 Q_R[OE]
U 1348	001D,2000,0180,0800,0010,1349	:2851 A[U_Q-D,CLK.UBCC
U 1349	0000,013C,0180,0800,0000,1148	:2852 Z?
U 1148	0000,003C,0180,0800,0000,134A	:2853 J/G1DP1 ; UTRAPPED
U 1149	0000,003C,0180,0800,0000,134D	:2854 J/G1DP2 ; NO UTRAP.
U 134A	0000,003C,0180,0800,0084,734B	:2855 G1DP1: SC_K[.8] ; SEE IF THE UTRAP WA
U 134B	0001,0024,0180,0800,0010,134C	:2856 ALD_D,ANDNOT,MASK,CLK.UBCC ; BECAUSE OF A CACHE PARITY ERROR
U 134C	0000,013C,0180,0800,0000,114A	:2857 Z?
U 114A	0000,003D,0180,0800,0000,11CC	:2858 ERROR1 ; NON CACHE PARITY ERROR UTRAP
U 114B	0000,003D,0180,0800,0000,11CC	:2859 ERROR1 ; CACHE PARITY UTRAP OCCURRED.
U 134D	0F00,003C,0180,0800,0000,134E	:2860 G1DP?: D_O
U 134E	0000,003C,7580,3C00,0000,114C	:2861 ID[MAINT],D

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:2862 .PAGE 'TEST DB PA<29> AFFECT ON HIT/MISS COMPARATORS TEST'
:2863 *****
:2864 **
:2865 TEST DB PA<29> AFFECT ON HIT/MISS COMPARATORS TEST
:2866
:2867 TEST DESCRIPTION
:2868 THIS IS A TEST OF THE HIT/MISS COMPARATORS' OF
:2869 BOTH GROUPS REACTION TO AN ADDRESS IN SYSTEM PHYSICAL
:2870 SPACE (I.E. PA<29>=1).
:2871
:2872 LOGIC DESCRIPTION
:2873 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2874 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2875 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2876 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2877 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2878 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2879 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2880 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2881 REGISTER ON THE SBI CONTROL MODULE.
:2882
:2883 ERROR DESCRIPTION
:2884 VA REFERENCED
:2885 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2886 ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
:2887 BITS ARE RELEVANT)
:2888 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2889 UTRAP OCCURS
:2890 GOT CACHE MAINT REGISTER
:2891 EXPECTED READ DATA
:2892 GOT READ DATA
:2893 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2894 FLAG UTRAP TYPE
:2895 ----
:2896 1DE NO UTRAP OCCURRED
:2897 DE CACHE PARITY UTRAP
:2898 15E TB PARITY ERROR
:2899 19E TB MISS
:2900 1CE TB PROTECTION ERROR
:2901 1D6 TB MODIFY BIT ERROR
:2902 1DA X PAGE UTRAP
:2903 1DC UNALIGNED DATA UTRAP
:2904
:2905 --
:2906 *****
:2907 =0
:2908 PA29A: NEWTST
:2909 D 0,R[0F] K[.6]
:2910 =0 ID[1BER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
:2911 NOP
:2912 =0 CALL J/SOFF ; TURN OFF SBI CYCLES
:2913 VA K[ZERO],D 0 ; INVALIDATE LOCATION 0 OF
:2914 FS7MCT,MCT/INVALIDATE ; BOTH GROUPS
:2915 =0 D 0,CALL,J/DC.1DE ; GENERATE CONSTANT TO BE USED AS UTRAP FLAG
:2916 R[0E]_D
    
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U 114C, 0000,003D,0180,0800,0000,11B8
U 114D, 0F18,0038,D580,09F8,0000,114E
U 114E, 0000,003D,4980,3C00,0000,1232
U 114F, 0000,003C,0180,0800,0000,1150
U 1150, 0000,003D,0180,0800,0000,121D
U 1151, 0F18,0038,1980,0800,0200,134F
U 134F, 0000,003C,0180,9000,0000,1152
U 1152, 0F00,003D,0180,0800,0000,11D5
U 1153, 0001,003C,0180,0AF0,0000,1350
    
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U 1350. 0003.003C.0180.0AF8.0000.1156 :2917 RCOF] 0
U 1156. 0000.003D.0180.0800.0000.1221 :2918 =0 CALL J/ROS : SET FORCE REPLACE GROUP 0 BIT
U 1157. 0010.0038.0180.0918.0200.1351 :2919 VA RC[3] : VA=06666000
U 1351. 0810.0038.0180.0910.0000.1352 :2920 D RC[2] : DATA=55555555
U 1352. 0000.003C.0180.9800.0000.1158 :2921 FS/MCT,MCT/VALIDATE : WRITE GROUP 0
U 1158. 0000.003D.0180.0800.0000.1225 :2922 =0 CALL J/RIS : SET FORCE REPLACE GROUP 1 BIT
U 1159. 0010.0038.0180.0908.0200.1353 :2923 VA RC[1] : VA=19999000
U 1353. 0810.0038.0180.0900.0000.1354 :2924 D RC[0] : DATA=AAAAAAAA
U 1354. 0000.003C.0180.9800.0000.115A :2925 FS/MCT,MCT/VALIDATE : WRITE GROUP 1
U 115A. 0000.003D.0180.0800.0000.121D :2926 =0 CALL J/SOFF : CLEAR FORCE REPLACE BITS
U 115B. 0810.0038.5180.0918.0084.7355 :2927 D RC[3],SC K[1E]
U 1355. 0001.003C.0580.09F0.0084.8356 :2928 SC SC-K[1],RC[0E]_D
U 1356. 0018.0038.1D80.0A88.0000.1357 :2929 RET] K[SC]
U 1357. 0001.001C.0180.0AA8.0200.1028 :2930 ALU D.ORNOT.MASK,VA_ALU,RC[5] ALU : VA=26666000
U 1028. 0000.003D.0180.0800.0000.1086 :2931 =00 CALL J/RMOM1 : REFERENCE TO 26666000 SHOULD BE A MISS
U 1029. 0000.003D.0180.0800.0000.11CC :2932 ERROR1 : UNEXPECTED UTRAP OCCURRED
U 102A. 0000.003D.0180.0800.0000.11CC :2933 ERROR1 : HIT/MISS BITS INCORRECT
U 102B. 0810.0038.0180.0908.0000.1358 :2934 D RC[1]
U 1358. 0001.003C.0180.09F0.0000.1359 :2935 RC[0E]_D
U 1359. 0000.003C.0180.0A08.0082.135A :2936 SC RC[1]
U 135A. 0001.001C.0180.0AA8.0200.102C :2937 ALU D.ORNOT.MASK,VA_ALU,RC[5] ALU : VA=39999000
U 102C. 0000.003D.0180.0800.0000.1086 :2938 =00 CALL J/RMOM1 : REFERENCE TO 39999000 SHOULD BE A MISS
U 102D. 0000.003D.0180.0800.0000.11CC :2939 ERROR1 : UNEXPECTED UTRAP OCCURRED
U 102E. 0000.003D.0180.0800.0000.11CC :2940 ERROR1 : HIT/MISS BITS INCORRECT
U 102F. 0810.0038.0180.0918.0200.135B :2941 VA RC[3],D_RC[3] : REFERENCE 06666000
U 135B. 0001.003C.0180.09F0.0000.135C :2942 RC[0E]_D
U 135C. 0010.0038.01C0.0910.0000.1030 :2943 Q RC[2]
U 1030. 0001.203D.0180.09D8.0000.1082 :2944 =00 CALL J/RMOM1,RC[0B]_Q : SHOULD STILL BE A HIT
U 1031. 0000.003D.0180.0800.0000.11CC :2945 ERROR1 : UNEXPECTED UTRAP OCCURRED
U 1032. 0000.003D.0180.0800.0000.11CC :2946 ERROR1 : HIT/MISS BITS INCORRECT
U 1033. 001D.2000.0180.0800.0010.135D :2947 ALU_Q-D,CLK.UBCC : DATA AT 06666000 SHOULD BE=55555555
U 135D. 0000.013C.0180.0800.0000.115C :2948 Z?
U 115C. 0000.003D.0180.0800.0000.11CC :2949 =0 ERROR1 : DATA INCORRECT
U 115D. 0810.0038.0180.0908.0200.135E :2950 VA RC[1],D_RC[1] : REFERENCE 19999000
U 135E. 0001.003C.0180.09F0.0000.135F :2951 RC[0E]_D
U 135F. 0010.0038.01C0.0900.0000.1034 :2952 Q RC[0]
U 1034. 0001.203D.0180.09D8.0000.1084 :2953 =00 CALL J/RMOM1,RC[0B]_Q : SHOULD BE A HIT IN GROUP 1
U 1035. 0000.003D.0180.0800.0000.11CC :2954 ERROR1 : UNEXPECTED UTRAP OCCURRED
U 1036. 0000.003D.0180.0800.0000.11CC :2955 ERROR1 : HIT/MISS BITS INCORRECT
U 1037. 001D.2000.0180.0800.0010.1360 :2956 ALU_Q-D,CLK.UBCC : DATA AT 19999000 SHOULD BE=AAAAAAAA
U 1360. 0000.013C.0180.0800.0000.115E :2957 Z?
U 115E. 0000.003D.0180.0800.0000.11CC :2958 =0 ERROR1 : DATA INCORRECT
U 115F. 0000.003C.0180.0800.0000.1160 :2959 NOP
  
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2960 .PAGE "TEST DC STATIC TEST OF GROUP 0'S AND GROUP 1'S DATA MEMORY"
2961 *****
2962 **
2963 TEST DC STATIC TEST OF GROUP 0'S AND GROUP 1'S DATA MEMORY
2964
2965 TEST DESCRIPTION
2966 THIS IS A TEST OF THE DATA MEMORY IN THE CACHE. A 1 IS FLOATED
2967 THROUGH ZERO'S AND A ZERO IS FLOATED THROUGH ONES IN EACH
2968 LOCATION OF THE DATA MEMORIES.
2969
2970 LOGIC DESCRIPTION
2971 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
2972 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
2973 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
2974 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
2975 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
2976 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
2977 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
2978 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
2979 REGISTER ON THE SBI CONTROL MODULE.
2980
2981 ERROR DESCRIPTION
2982 VA REFERENCED
2983 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
2984 ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
2985 BITS ARE RELEVANT)
2986 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
2987 UTRAP OCCURS
2988 GOT CACHE MAINT REGISTER
2989 EXPECTED READ DATA
2990 GOT READ DATA
2991 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
2992 FLAG UTRAP TYPE
2993 -----
2994 1DE NO UTRAP OCCURRED
2995 DE CACHE PARITY UTRAP
2996 15E TB PARITY ERROR
2997 19E TB MISS
2998 1CE TB PROTECTION ERROR
2999 1D6 TB MODIFY BIT ERROR
3000 1DA X PAGE UTRAP
3001 1DC UNALIGNED DATA UTRAP
3002
3003 0/1, GROUP BEING TESTED
3004
3005 *****
3006 =0
3007 DMENT: NEWTST
3008 D_0
3009 =0 ID[TBRO]_D,CALL,J/ROM1S ; TB OFF AND SET THE FORCE REPLACE GROUP 0
3010 ; FORCE MISS GROUP 1 BITS.
3011 RC[8]_0 ; FLAG WHICH INDICATES WHICH
3012 ; GROUP IS BEING TESTED.
3013 RC[OF]_K[.7]
3014 R[1]_0
3015 =0 D_0,CALL,J/DC.1DE ; GENERATE CONSTANT FOR UTRAP FLAG
    
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U 1160, 0000,003D,0180,0800,0000,1188
U 1161, 0F00,003C,0180,0800,0000,1162
U 1162, 0000,003D,4980,3C00,0000,122E
U 1163, 0003,003C,0180,09C0,0000,1361
U 1361, 0018,0038,5D80,09F8,0000,1362
U 1362, 0003,003C,0180,0A88,0000,1164
U 1164, 0F00,003D,0180,0800,0000,11D5
    
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U 1165. 0001,003C,0180,0AF0,0000,1363 :3015      R[OE] D
U 1363. 0818,0038,8180,0800,0000,1364 :3016      D MEMT1: D_K[.3FF]          ; SET UP THE LOCATION COUNTER
U 1364. 0100,003C,0180,0800,0000,1365 :3017      D_D.LEFT2,SI/ZERO      ; AND CACHE ADDRESS BEING TESTED.
U 1365. 0001,003C,0180,09F0,0000,1366 :3018      R[OE] D
U 1366. 0018,0038,8D80,0A80,0000,1367 :3019      D MEMT2: R[0] K[.1F]      ; COUNTER FOR BIT POSITION
U 1367. 0000,003C,0180,0A08,0010,1368 :3020      ALU_R[1],CLK.UBCC      ; CODE FOR EXECUTING ERLOOP
U 1368. 0000,013C,0180,0800,0000,1166 :3021      Z?                    ; ONLY ONCE.
U 1166. 0000,003C,0180,0800,0000,1169 :3022      =0                    J/D MEMT3
U 1167. 0018,0038,C180,0A88,0000,1168 :3023      R[1] K[.FFFF]
U 1168. 0000,003D,0180,0800,0000,11CB :3024      =0                    ERLOOP
U 1169. 0000,003C,0180,0A00,0082,1369 :3025      D MEMT3: SC R[0]          ; GENERATE TEST DATA
U 1369. 0800,0038,0180,09D8,0000,136A :3026      ALD MASK,R[0B],ALU,D_ALU ; 0 IN 1'S.
U 136A. 0010,0038,0180,0970,0200,136B :3027      VA R[OE]                ; SET UP TEST ADDRESS
U 136B. 0000,003C,0180,9800,0000,136C :3028      FS7MCT,MCT/VALIDATE      ; WRITE DATA INTO TEST ADDRESS OF
                                     ; THE GROUP BEING TESTED.
                                     ; SEE WHICH GROUP IS BEING TESTED.
U 136C. 0010,0038,0180,0940,0010,136D :3029
U 136D. 0000,013C,0180,0800,0000,116A :3030      ALU_RC[8],CLK.UBCC
U 116A. 0000,003C,0180,0800,0000,1373 :3031      Z?
                                     :3032      =0                    J/D MEMT4
                                     :3033      ; TESTING GROUP ZERO:
U 116B. 0F00,003C,0180,0800,0000,1038 :3034      D 0
U 1038. 0000,003D,0180,0800,0000,1082 :3035      =00                   CALL,J/RHOM1          ; READ TEST ADDRESS AND CHECK FOR GROUP 0 HIT.
U 1039. 0000,003D,0180,0800,0000,11CC :3036      ERROR1                ; UNEXPECTED UTRAP OCCURRED
U 103A. 0000,003D,0180,0800,0000,11CC :3037      ERROR1                ; HIT/MISS BITS INCORRECT.
U 1039. 0010,0038,01C0,0958,0000,136E :3038      Q RC[0B]                ; CHECK THE DATA
U 136E. 001D,2000,0180,0800,0010,136F :3039      A[U_Q-D,CLK.UBCC
U 136F. 0000,013C,0180,0800,0000,116C :3040      Z?
U 116C. 0000,003D,0180,0800,0000,11CC :3041      =0                    ERROR1          ; DATA INCORRECT.
U 116D. 0010,0038,01C0,0958,0000,1370 :3042      Q RC[0B]                ; NOW TEST 1 IN 0'S
U 1370. 0801,2028,0180,09D8,0000,103C :3043      A[U NOT.Q,D,ALU,RC[0B],ALU
U 103C. 0000,003D,0180,0800,0000,1216 :3044      =00                   CALL,J/WRITE        ; WRITE GROUP 0
U 103D. 0000,003D,0180,0800,0000,11CC :3045      ERROR1                ; UNEXPECTED UTRAP OCCURRED
U 103E. 0F00,003C,0180,0800,0000,103F :3046      D 0
U 103F. 0000,003C,0180,0800,0000,1040 :3047      NOP
U 1040. 0000,003D,0180,0800,0000,1082 :3048      =00                   CALL,J/RHOM1        ; READ DATA BACK.
U 1041. 0000,003D,0180,0800,0000,11CC :3049      ERROR1                ; UNEXPECTED UTRAP OCCURRED
U 1042. 0000,003D,0180,0800,0000,11CC :3050      ERROR1                ; HIT/MISS BITS INCORRECT.
U 1043. 0010,0038,01C0,0958,0000,1371 :3051      Q RC[0B]                ; CHECK DATA.
U 1371. 001D,2000,0180,0800,0010,1372 :3052      A[U_Q-D,CLK.UBCC
U 1372. 0000,013C,0180,0800,0000,116E :3053      Z?
U 116E. 0000,003D,0180,0800,0000,11CC :3054      =0                    ERROR1          ; DATA INCORRECT.
U 116F. 0000,003C,0180,0800,0000,1379 :3055      J/D MEMT5
                                     :3056      ; TESTING GROUP ONE.
U 1373. 0F00,003C,0180,0800,0000,1044 :3057      D MEMT4: D 0
U 1044. 0000,003D,0180,0800,0000,1084 :3058      =00                   CALL,J/RHOM1        ; READ LOCATION BEING TESTED, HIT IN GROUP 1
U 1045. 0000,003D,0180,0800,0000,11CC :3059      ERROR1                ; UNEXPECTED UTRAP OCCURRED
U 1046. 0000,003D,0180,0800,0000,11CC :3060      ERROR1                ; HIT/MISS BITS INCORRECT.
U 1047. 0010,0038,01C0,0958,0000,1374 :3061      Q RC[0B]                ; CHECK THE DATA
U 1374. 001D,2000,0180,0800,0010,1375 :3062      A[U_Q-D,CLK.UBCC
U 1375. 0000,013C,0180,0800,0000,1170 :3063      Z?
U 1170. 0000,003D,0180,0800,0000,11CC :3064      =0                    ERROR1          ; DATA INCORRECT.
U 1171. 0010,0038,01C0,0958,0000,1376 :3065      Q RC[0B]                ; NOW WRITE THE COMPLEMENT PATTERN
U 1376. 0801,2028,0180,09D8,0000,1048 :3066      A[U NOT.Q,D,ALU,RC[0B],ALU ; 1 IN 0'S
U 1048. 0000,003D,0180,0800,0000,1216 :3067      =00                   CALL,J/WRITE        ; WRITE GROUP 1
U 1049. 0000,003D,0180,0800,0000,11CC :3068      ERROR1                ; UNEXPECTED UTRAP OCCURRED
U 104A. 0F00,003C,0180,0800,0000,104B :3069      D 0
    
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U 104B, 0000,003C,0180,0800,0000,1050 :3070
U 1050, 0000,003D,0180,0800,0000,1084 :3071 =00 CALL,J/RMOH1 ; READ DATA BACK FROM GROUP 1
U 1051, 0000,003D,0180,0800,0000,11CC :3072 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 1052, 0000,003D,0180,0800,0000,11CC :3073 ERROR1 ; HIT/MISS BITS INCORRECT.
U 1053, 0010,0038,01C0,0958,0000,1377 :3074 Q RC[0B] ; CHECK THE DATA
U 1377, 001D,2000,0180,0800,0010,1378 :3075 A[U_Q-D,CLK.UBCC
U 1378, 0000,013C,0180,0800,0000,1172 :3076 Z?
U 1172, 0000,003D,0180,0800,0000,11CC :3077 =0 ERROR1 ; DATA INCORRECT.
U 1173, 0000,003C,0180,0800,0000,1379 :3078 NOP
U 1379, 0000,003C,0180,0A00,0010,137A :3079 DMEMT5: ALU_RC[0],CLK.UBCC ; SEE IF ALL BITS HAVE BEEN TESTED
U 137A, 0000,013C,0180,0800,0000,1174 :3080 Z?
U 1174, 0018,0000,0580,0A80,0000,1169 :3081 =0 RC[0]_LA-K[.1],J/DMEMT3 ; IF NOT GO TO NEXT BIT IN THIS LOCATION
:3082 ; OF THE GROUP BEING TESTED.
U 1175, 0810,0038,0180,0970,0010,137B :3083 D RC[0E],CLK.UBCC ; SEE IF ALL LOCATIONS IN THIS GROUP HAVE BEEN TESTE
U 137B, 0000,013C,0180,0800,0000,1176 :3084 Z?
U 1176, 0019,0000,1180,09F0,0000,1366 :3085 =0 ALU_D-K[.4],RC[0E]_ALU,J/DMEMT2 ; IF NOT DECREMENT ADDRESS AND CONTINUE
U 1177, 0010,0038,0180,0940,0010,137C :3086 ALU_RC[8],CLK.UBCC ; SEE IF BOTH GROUPS HAVE BEEN TESTED.
U 137C, 0000,013C,0180,0800,0000,1178 :3087 Z?
U 1178, 0000,003C,0180,0800,0000,137D :3088 =0 J/DMEMT6
U 1179, 0018,0038,0580,09C0,0000,117A :3089 RC[8] K[.1] ; IF NOT GO BACK AND TEST GROUP 1
U 117A, 0000,003D,0180,0800,0000,1231 :3090 =0 CALL,J/RIMOS ; SET THE FORCE REPLACE GROUP 1 BIT AND FORCE MISS
:3091 ; GROUP 0 BIT
U 117B, 0000,003C,0180,0800,0000,1363 :3092 J/DMEMT1
U 137D, 0000,003C,0180,0800,0000,1180 :3093 DMEMT6: NOP
  
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:3094 .PAGE "TEST DD STATIC TEST OF GROUP 0'S ADDRESS MEMORY"
:3095 *****
:3096 ++
:3097 TEST DD STATIC TEST OF GROUP 0'S ADDRESS MEMORY
:3098
:3099 TEST DESCRIPTION
:3100 THIS TEST FLOATS A 1 THROUGH 0'S AND A 0 THROUGH 1'S IN
:3101 EACH LOCATION OF THE CACHE GROUP ZERO'S ADDRESS MEMORY.
:3102 ADDRESS BITS <28:12> ARE STORED TERE.
:3103
:3104 LOGIC DESCRIPTION
:3105 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:3106 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:3107 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:3108 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:3109 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:3110 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:3111 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:3112 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:3113 REGISTER ON THE SBI CONTROL MODULE.
:3114
:3115 ERROR DESCRIPTION
:3116 VA REFERENCED
:3117 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:3118 ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
:3119 BITS ARE RELEVANT)
:3120 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:3121 UTRAP OCCURS
:3122 GOT CACHE MAINT REGISTER
:3123 EXPECTED READ DATA
:3124 GOT READ DATA
:3125 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:3126 FLAG UTRAP TYPE
:3127 ----
:3128 1DE NO UTRAP OCCURRED
:3129 DE CACHE PARITY UTRAP
:3130 15E TB PARITY ERROR
:3131 19E TB MISS
:3132 1CE TB PROTECTION ERROR
:3133 1D6 TB MODIFY BIT ERROR
:3134 1DA X PAGE UTRAP
:3135 1DC UNALIGNED DATA UTRAP
:3136
:3137 --
:3138 *****
:3139 =0
:3140 AMTGO: NEWTST
:3141 D 0
:3142 =0 1D[TBRO]_D,CALL,J/SOFF : TB AND SBI CYCLES OFF
:3143 D_K[.3FF] : GENERATE SOME COUNTER AND ADDRESS VALUES
:3144 D-D,LEFT2,S1/ZERO
:3145 R[7]_D
:3146 =0 D 0,CALL,J/DC.1DE : INITIALIZE UTRAP FLAG
:3147 R[OE]_D
:3148 R[OF]_0
    
```

```

U 1180. 0000.003D.0180.0800.0000.1188
U 1181. 0F00.003C.0180.0800.0000.1182
U 1182. 0000.003D.4980.3C00.0000.121D
U 1183. 0818.0038.8180.0800.0000.137E
U 137E. 0100.003C.0180.0800.0000.137F
U 137F. 0001.003C.0180.0AB8.0000.1184
U 1184. 0F00.003D.0180.0800.0000.11D5
U 1185. 0001.003C.0180.0AF0.0000.1380
U 1380. 0003.003C.0180.0AF8.0000.1381
    
```



```

U 1381, 0018,0038,D580,09F8,0000,1186 :3149
:3150
=0 RC[0F],K[.6]
U 1186, 0F00,003C,0180,0A38,0200,1187 :3151
U 1187, 0000,003C,0180,9000,0000,1382 :3152
U 1382, 0000,003C,0180,0A38,0010,1383 :3153
U 1383, 0000,013C,0180,0800,0000,1188 :3154
U 1188, 0018,0000,0580,0A88,0000,1186 :3155
U 1189, 0018,0038,49C0,0800,0000,1384 :3156
U 1384, 0000,003C,03A8,0800,0000,118A :3157
U 118A, 0001,203D,0180,0A80,0000,122E :3158
U 118B, 0003,003C,0180,0A88,0000,1385 :3159
U 1385, 0000,003C,8580,0800,0084,7386 :3160
U 1386, 0803,0010,6580,0800,0084,9387 :3161
U 1387, 0000,003C,0580,0800,0084,9388 :3162
U 1388, 0003,0010,01C0,0800,0000,1389 :3163
U 1389, 001D,0024,0180,0A88,0000,138A :3164
U 138A, 0003,003C,0180,0AD0,0000,138B :3165
U 138B, 0018,0038,6580,0A90,0000,138C :3166
U 138C, 0000,003C,0180,0A50,0010,138D :3167
U 138D, 0000,013C,0180,0800,0000,118C :3168
U 118C, 0000,003C,0180,0800,0000,118F :3169
U 118D, 0018,0038,C180,0AD0,0000,118E :3170
U 118E, 0000,003D,0180,0800,0000,11CB :3171
U 118F, 0800,003C,0180,0A10,0000,138E :3172
U 138E, 0019,0014,8580,0A98,0082,138F :3173
U 138F, 0001,003C,0180,09D8,0000,1390 :3174
U 1390, 0800,003C,0180,0A08,0000,1391 :3175
U 1391, 0001,001C,0180,09F0,0200,1392 :3176
U 1392, 0810,0038,0180,0958,0000,1393 :3177
U 1393, 0000,003C,0180,9800,0000,1054 :3178
U 1054, 0000,003D,0180,0800,0000,1082 :3179
U 1055, 0000,003D,0180,0800,0000,11CC :3180
U 1056, 0000,003D,0180,0800,0000,11CC :3181
U 1057, 0010,0038,01C0,0958,0000,1394 :3182
U 1394, 001D,2000,0180,0800,0010,1395 :3183
U 1395, 0000,013C,0180,0800,0000,1190 :3184
U 1190, 0000,003D,0180,0800,0000,11CC :3185
U 1191, 0000,003C,0180,0A18,0082,1396 :3186
U 1396, 0800,003C,0180,0A10,0000,1397 :3187
U 1397, 0001,0028,0180,09D8,0000,1398 :3188
U 1398, 0000,0034,01C0,0A28,0000,1399 :3189
U 1399, 001C,0030,01C0,0A08,0200,139A :3190
U 139A, 0001,203C,0180,09F0,0000,139B :3191
U 139B, 0810,0038,0180,0958,0000,139C :3192
U 139C, 0000,003C,0180,9800,0000,1060 :3193
U 1060, 0000,003D,0180,0800,0000,1082 :3194
U 1061, 0000,003D,0180,0800,0000,11CC :3195
U 1062, 0000,003D,0180,0800,0000,11CC :3196
U 1063, 0010,0038,01C0,0958,0000,139D :3197
U 139D, 001D,2000,0180,0800,0010,139E :3198
U 139E, 0000,013C,0180,0800,0000,1192 :3199
U 1192, 0000,003D,0180,0800,0000,11CC :3200
U 1193, 0000,003C,0180,0A10,0010,139F :3201
U 139F, 0000,013C,0180,0800,0000,1194 :3202
U 1194, 0018,0000,0580,0A90,0000,118F :3203

:3149 RC[0F],K[.6]
:3150
:3151 AMTGOA: VA RC[7],D 0 ; INVALIDATE EVERY LOCATION IN BOTH
:3152 FS7MCT,MCT/INVALIDATE ; CACHE GROUPS
:3153 ALU_RC[7],CLK.UBCC
:3154 Z?
:3155 =0 RC[7],LA-K[.1],J/AMTGOA
:3156 Q_K[.FF]
:3157 Q-Q.LEFT,S1/7 ; GENERATE A COUNTER RC[0]=1FE
:3158 =0 RC[0],Q,CALL,J/ROM1S ; SET FORCE GROUP 1 MISSES AND REPLACE GROUP 0 BITS.
:3159 RC[1]-0
:3160 SC K[.C] ; GENERATE AN ADDRESS MASK
:3161 ALU_MASK+1,D_ALU.SC_SC+K[.10]
:3162 SC SC+K[.1] ; SC=29.
:3163 ALU_MASK+1,Q_ALU
:3164 ALU_D[ANDNOT]Q,RC[5],ALU ; RC[5]=1FFFF000
:3165 RC[0A] 0
:3166 AMTGOB: RC[2],RC[.10] ; GENERATE COUNTER FOR TAG BITS
:3167 ALU_RC[0A],CLK.UBCC ; CODE SO THAT ERLOOP IS EXECUTED ONLY ONCE
:3168 Z?
:3169 =0 J/AMTGOC
:3170 RC[0A],K[.FFFF]
:3171 =0 ERLOOP
:3172 AMTGOC: D RC[2] ; GENERATE 1IN 0'S TEST ADDRESS PATTERN
:3173 ALU_D+K[.C],SC_ALU,RC[3],ALU
:3174 RC[0B],D
:3175 D RC[1]
:3176 ALU_D.ORNOT.MASK,VA_ALU,RC[0E],ALU
:3177 D RC[0B] ; DATA=COUNTER FOR TAG BITS
:3178 FS7MCT,MCT/VALIDATE ; WRITE GROUP 0
:3179 =00 CALL,J/RHOM1 ; READ HIT IN GROUP 0
:3180 ERROR1 ; UNEXPECTED UTRAP OCCURRED
:3181 ERROR1 ; HIT/MISS BITS INCORRECT
:3182 Q RC[0B] ; CHECK THE DATA READ
:3183 ALU_Q-D,CLK.UBCC
:3184 Z?
:3185 =0 ERROR1 ; DATA INCORRECT
:3186 SC RC[3] ; GENERATE 0 IN 1'S TEST ADDRESS PATTERN
:3187 D RC[2]
:3188 ALU_NOT.D,RC[0B],ALU
:3189 ALU_RC[5].AND.MASK,Q_ALU
:3190 LAB RC[1],ALU_LA[OR]Q,VA_ALU,Q_ALU
:3191 RC[0E] Q
:3192 D RC[0B]
:3193 FS7MCT,MCT/VALIDATE ; WRITE GROUP 0
:3194 =00 CALL,J/RHOM1 ; CHECK GROUP 0 HIT
:3195 ERROR1 ; UNEXPECTED UTRAP OCCURRED
:3196 ERROR1 ; HIT/MISS BITS INCORRECT
:3197 Q RC[0B] ; CHECK DATA READ
:3198 ALU_Q-D,CLK.UBCC
:3199 Z?
:3200 =0 ERROR1 ; DATA INCORRECT
:3201 ALU_RC[2],CLK.UBCC ; TESTED ALL BITS IN THIS LOCATION?
:3202 Z?
:3203 =0 RC[2],LA-K[.1],J/AMTGOC ; IF NOT CONTINUE TESTING THIS LOCATION
    
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ZZ-ESKAH-V132 TEST DD STATIC TEST OF GROUP 0'S ADDRESS MEMORY F 3
ESKAH2E.MCR MICRO2 1M(01) 16-DEC-82 11:51:27

SEQ 0645
Page 7

U 1195.	0800,003C,0180,0A08,0000,13A0	:3204		D R[1]	: INCREMENT THE ADDRESS
U 13A0.	0019,0014,0180,0A88,0000,13A1	:3205		A[U_D+K[.8],R[1],ALU	
U 13A1.	0000,003C,0180,0A00,0010,13A2	:3206		ALU_R[0],CLK.UBC	: TESTED ALL LOCATION?
U 13A2.	0000,013C,0180,0800,0000,1196	:3207		Z?	
U 1196.	0018,0000,0580,0A80,0000,138B	:3208	=0	R[0]_LA-K[.1],J/AMTGOB	: IF NOT GO TEST NEXT LOCATION
U 1197.	0000,003C,0180,0800,0000,1198	:3209		NOP	

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:3210 .PAGE 'TEST DE STATIC TEST OF GROUP 1'S ADDRESS MEMORY'
:3211 *****
:3212 **
:3213 TEST DE STATIC TEST OF GROUP 1'S ADDRESS MEMORY
:3214
:3215 TEST DESCRIPTION
:3216 THIS TEST FLOATS A 1 THROUGH 0'S AND A 0 THROUGH 1'S IN
:3217 EACH LOCATION OF THE CACHE GROUP ONE'S ADDRESS MEMORY.
:3218 ADDRESS BITS <28:12> ARE STORED TERE.
:3219
:3220 LOGIC DESCRIPTION
:3221 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:3222 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:3223 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:3224 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:3225 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:3226 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:3227 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:3228 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:3229 REGISTER ON THE SBI CONTROL MODULE.
:3230
:3231 ERROR DESCRIPTION
:3232 VA REFERENCED
:3233 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:3234 ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
:3235 BITS ARE RELEVANT)
:3236 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:3237 UTRAP OCCURS
:3238 GOT CACHE MAINT REGISTER
:3239 EXPECTED READ DATA
:3240 GOT READ DATA
:3241 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:3242 FLAG UTRAP TYPE
:3243 ----
:3244 1DE NO UTRAP OCCURRED
:3245 DE CACHE PARITY UTRAP
:3246 15E TB PARITY ERROR
:3247 19E TB MISS
:3248 1CE TB PROTECTION ERROR
:3249 1D6 TB MODIFY BIT ERROR
:3250 1DA X PAGE UTRAP
:3251 1DC UNALIGNED DATA UTRAP
:3252
:3253 --
:3254 *****
:3255 =0
:3256 AMTG1: NEWTST
:3257 D_0
:3258 =0 ID[TBERO]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
:3259 D_KC.3FF] ; INITIALIZE SOME COUNTERS
:3260 D_D.LEFT2,S1/ZERO
:3261 R[7]_D
:3262 =0 D_0,CALL,J/DC.1DE ; SET UP UTRAP FLAG
:3263 R[OE]_D
:3264 R[OF]_0
    
```

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U 1198, 0000,003D,0180,0800,0000,11B8
U 1199, 0F00,003C,0180,0800,0000,119A
U 119A, 0000,003D,4980,3C00,0000,121D
U 119B, 0818,0038,8180,0800,0000,13A3
U 13A3, 0100,003C,0180,0800,0000,13A4
U 13A4, 0001,003C,0180,0A88,0000,119C
U 119C, 0F00,003D,0180,0800,0000,11D5
U 119D, 0001,003C,0180,0AF0,0000,13A5
U 13A5, 0003,003C,0180,0AF8,0000,13A6
    
```



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U 13A6, 0018,0038,D580,09F8,0000,119E :3265      RC[0F],K[.6]
:3266      =0
U 119E, 0F00,003C,0180,0A38,0200,119F :3267      AMTG1A: VA_R[7],D_0      : INVALIDATE EVERY LOCATION OF EACH GROUP
U 119F, 0000,003C,0180,9000,0000,13A7 :3268      FS/MCT,MCT/INVALIDATE
U 13A7, 0000,003C,0180,0A38,0010,13A8 :3269      ALU_R[7],CLK.UBCC
U 13A8, 0000,013C,0180,0800,0000,11A0 :3270      Z?
U 11A0, 0018,0000,0580,0A88,0000,119E :3271      =0      R[7],LA-K[.1],J/AMTG1A
U 11A1, 0018,0038,49C0,0800,0000,13A9 :3272      Q_K[.FF]
U 13A9, 0000,003C,03A8,0800,0000,11A2 :3273      Q-Q.LEFT,S1/7
U 11A2, 0001,203D,0180,0A80,0000,1231 :3274      =0      R[0],Q,CALL,J/R1M0S      : SET FORCE REPLACE GROUP 1 FORCE MISSES TO GROUP 0
U 11A3, 0003,003C,0180,0A88,0000,13AA :3275      R[1],0
U 13AA, 0000,003C,8580,0800,0084,73AB :3276      SC_K[.C]      : GENERATE A MASK FOR THE TAG
U 13AB, 0803,0010,6580,0800,0084,93AC :3277      ALU_MASK+1,D_ALU,SC_SC+K[.10]
U 13AC, 0000,003C,0580,0800,0084,93AD :3278      SC_SC+K[.1]      : SC=29.
U 13AD, 0003,0010,01C0,0800,0000,13AE :3279      ALU_MASK+1,Q_ALU
U 13AE, 001D,0024,0180,0AA8,0000,13AF :3280      ALU_D[ANDNOT]Q,R[5],ALU      : R[5]=1FFFF000
U 13AF, 0003,003C,0180,0AD0,0000,13B0 :3281      R[0A],0
U 13B0, 0018,0038,6580,0A90,0000,13B1 :3282      AMTG1B: R[2],K[.10]      : INITIALIZE THE TAG BIT COUNTER
U 13B1, 0000,003C,0180,0A50,0010,13B2 :3283      ALU_R[0A],CLK.UBCC      : CODE FOR EXECUTING ERLOOP ONLY ONCE
U 13B2, 0000,013C,0180,0800,0000,11A4 :3284      Z?
U 11A4, 0000,003C,0180,0800,0000,11A7 :3285      =0      J/AMTG1C
U 11A5, 0018,0038,C180,0AD0,0000,11A6 :3286      R[0A],K[.FFFF]
U 11A6, 0000,003D,0180,0800,0000,11CB :3287      =0      ERLOOP
U 11A7, 0800,003C,0180,0A10,0000,13B3 :3288      AMTG1C: D_R[2]      : GENERATE 1 IN 0'S ADDRESS TEST PATTERN
U 13B3, 0019,0014,8580,0A98,0082,13B4 :3289      A[U_D+K[.C],SC_ALU,R[3],ALU
U 13B4, 0001,003C,0180,09D8,0000,13B5 :3290      RC[0B],D
U 13B5, 0800,003C,0180,0A08,0000,13B6 :3291      D_R[1]
U 13B6, 0001,001C,0180,09F0,0200,13B7 :3292      A[U_D,ORNOT.MASK,VA_ALU,RC[0E],ALU
U 13B7, 0810,0038,0180,0958,0000,13B8 :3293      D_RC[0B]
U 13B8, 0000,003C,0180,9800,0000,1064 :3294      FS/MCT,MCT/VALIDATE      : WRITE GROUP 1
U 1064, 0000,003D,0180,0800,0000,1084 :3295      =00      CALL,J/RM0H1      : READ GROUP 1 HIT
U 1065, 0000,003D,0180,0800,0000,11CC :3296      ERROR1      : UNEXPECTED UTRAP OCCURRED
U 1066, 0000,003D,0180,0800,0000,11CC :3297      ERROR1      : HIT/MISS BITS INCORRECT
U 1067, 0010,0038,01C0,0958,0000,13B9 :3298      Q_RC[0B]      : CHECK GROUP 1 DATA
U 13B9, 001D,2000,0180,0800,0010,13BA :3299      A[U_Q-D,CLK.UBCC
U 13BA, 0000,013C,0180,0800,0000,11A8 :3300      Z?
U 11A8, 0000,003D,0180,0800,0000,11CC :3301      =0      ERROR1      : DATA INCORRECT
U 11A9, 0000,003C,0180,0A18,0082,13BB :3302      SC_R[3]      : GENERATE 0 IN 1'S ADDRESS PATTERN
U 13BB, 0800,003C,0180,0A10,0000,13BC :3303      D_R[2]
U 13BC, 0001,0028,0180,09D8,0000,13BD :3304      A[U_NOT,D,RC[0B],ALU
U 13BD, 0000,0034,01C0,0A28,0000,13BE :3305      ALU_R[5],AND.MASK,Q_ALU
U 13BE, 001C,0030,01C0,0A08,0200,13BF :3306      LAB_R[1],ALU_LA[OR]Q,VA_ALU,Q_ALU
U 13BF, 0001,203C,0180,09F0,0000,13C0 :3307      RC[0E],Q
U 13C0, 0810,0038,0180,0958,0000,13C1 :3308      D_RC[0B]
U 13C1, 0000,003C,0180,9800,0000,1068 :3309      FS/MCT,MCT/VALIDATE      : WRITE GROUP 1
U 1068, 0000,003D,0180,0800,0000,1084 :3310      =00      CALL,J/RM0H1      : READ GROUP 1 HIT
U 1069, 0000,003D,0180,0800,0000,11CC :3311      ERROR1      : UNEXPECTED UTRAP OCCURRED
U 106A, 0000,003D,0180,0800,0000,11CC :3312      ERROR1      : HIT/MISS BITS INCORRECT
U 106B, 0010,0038,01C0,0958,0000,13C2 :3313      Q_RC[0B]      : CHECK DATA
U 13C2, 001D,2000,0180,0800,0010,13C3 :3314      A[U_Q-D,CLK.UBCC
U 13C3, 0000,013C,0180,0800,0000,11AA :3315      Z?
U 11AA, 0000,003D,0180,0800,0000,11CC :3316      =0      ERROR1      : DATA INCORRECT
U 11AB, 0000,003C,0180,0A10,0010,13C4 :3317      ALU_R[2],CLK.UBCC      : TESTED ALL BITS IN THIS TAG LOCATION?
U 13C4, 0000,013C,0180,0800,0000,11AC :3318      Z?
U 11AC, 0018,0000,0580,0A90,0000,11A7 :3319      =0      R[2],LA-K[.1],J/AMTG1C      : IF NOT CONTINUE
    
```


1 3

NW	00	0000	00	00	0000	0
00	0000	00	00	0000	00000000	

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U 11AD, 0800,003C,0180,0A08,0000,13C5 :3320      D R[1]
U 13C5, 0019,0014,0180,0A88,0000,13C6 :3321      A[U_D+K[.8],R[1],ALU      : INCREMENT ADDRESS
U 13C6, 0000,003C,0180,0A00,0010,13C7 :3322      ALU_R[0],CLK.UBC[      : TESTED ALL LOCATIONS?
U 13C7, 0000,013C,0180,0800,0000,11AE :3323      Z?
U 11AE, 0018,0000,0580,0A80,0000,13B0 :3324      =0      R[0]_LA-K[.1],J/AMTG1B      : IF NOT TEST NEXT LOCATION
U 11AF, 0000,003C,0180,0800,0000,13C8 :3325      NOP
U 13C8, 0000,003D,0180,0800,0000,11B8 :3326      DUM1:      NEWTST

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- 0FFF Unused							
U 1000	1871:	1838	1845=	1861=	2257=	2258=	2259=	2260=
U 1008	2262=	2263=	2264=	2265=	2277=	2278=	2279=	2280=
U 1010	2283=	2284=	2285=	2286=	2298=	2299=	2300=	2301=
U 1018	2304=	2305=	2306=	2307=	2319=	2320=	2321=	2322=
U 1020	2325=	2326=	2327=	2328=	2339=	2340=	2341=	2342=
U 1028	2931=	2932=	2933=	2934=	2938=	2939=	2940=	2941=
U 1030	2944=	2945=	2946=	2947=	2953=	2954=	2955=	2956=
U 1038	3035=	3036=	3037=	3038=	3044=	3045=	3046=	3047=
U 1040	3048=	3049=	3050=	3051=	3058=	3059=	3060=	3061=
U 1048	3067=	3068=	3069=	3070=	1862=	1863=	1902:	1839
U 1050	3071=	3072=	3073=	3074=	3179=	3180=	3181=	3182=
U 1058	1952=	1953=	1905:	1840	1954=	1955=	1908:	1841
U 1060	3194=	3195=	3196=	3197=	3295=	3296=	3297=	3298=
U 1068	3310=	3311=	3312=	3313=	1980=	1981=	1983=	1984=
U 1070	1986=	1987=	1990=	1991=	1993=	1994=	1996=	1997=
U 1078	2000=	2001=	2004=	2005=	2022=	2023=	2025=	2026=
U 1080	2035=	2036=	2038=	2039=	2041=	2042=	2044=	2045=
U 1088	2065=	2066=	2074=	2075=	2088=	2089=	2136=	2137=
U 1090	2139=	2140=	2144=	2145=	2147=	2148=	2159=	2160=
U 1098	2161=	2162=	2163=	2164=	2219=	2220=	2221=	2222=
U 10A0	2224=	2225=	2227=	2228=	2231=	2232=	2235=	2236=
U 10A8	2242=	2243=	2250=	2251=	2254=	2255=	2267=	2268=
U 10B0	2269=	2270=	2274=	2275=	2288=	2289=	2290=	2291=
U 10B8	2295=	2296=	2309=	2310=	2311=	2312=	2316=	2317=
U 10C0	2330=	2331=	2334=	2335=	2344=	2345=	2396=	2397=
U 10C8	2398=	2399=	2400=	2401=	2403=	2404=	2410=	2411=
U 10D0	2416=	2417=	2422=	2423=	2426=	2427=	2435=	2436=
U 10D8	2442=	2443=	2450=	2451=	2459=	2460=	2474=	2475=
U 10E0	2479=	2480=	2485=	2486=	2492=	2493=	2500=	2501=
U 10E8	2503=	2504=	2511=	2512=	2563=	2564=	2565=	2566=
U 10F0	2567=	2568=	2570=	2571=	2575=	2576=	2577=	2578=
U 10F8	2580=	2581=	2586=	2587=	2592=	2593=	2596=	2597=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1842	2605=	2606=	1834:	1835:	1836:	1837:
U 1110	2612=	2613=	2620=	2621=	2629=	2630=	2644=	2645=
U 1118	2649=	2650=	2655=	2656=	2662=	2663=	2670=	2671=
U 1120	2676=	2677=	2683=	2684=	2721=	2722=	2723=	2724=
U 1128	2725=	2726=	2728=	2729=	2731=	2732=	2737=	2738=
U 1130	2741=	2742=	2745=	2746=	2764=	2765=	2769=	2770=
U 1138	2809=	2810=	2811=	2812=	2813=	2814=	2816=	2817=
U 1140	2819=	2820=	2825=	2826=	2829=	2830=	2833=	2834=
U 1148	2853=	2854=	2858=	2859=	2908=	2909=	2910=	2911=
U 1150	2912=	2913=	2915=	2916=	1843	1928:	2918=	2919=
U 1158	2922=	2923=	2926=	2927=	2949=	2950=	2958=	2959=
U 1160	3006=	3007=	3008=	3010=	3014=	3015=	3022=	3023=
U 1168	3024=	3025=	3032=	3034=	3041=	3042=	3054=	3055=
U 1170	3064=	3065=	3077=	3078=	3081=	3083=	3085=	3086=
U 1178	3088=	3089=	3090=	3092=	2011:	2012:	2013:	2014:
U 1180	3140=	3141=	3142=	3143=	3146=	3147=	3151=	3152=
U 1188	3155=	3156=	3158=	3159=	3169=	3170=	3171=	3172=
U 1190	3185=	3186=	3200=	3201=	3203=	3204=	3208=	3209=
U 1198	3256=	3257=	3258=	3259=	3262=	3263=	3267=	3268=

ESKAH2E.MCR

MICRO2

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K 3

SEQ 0650

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;Location

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U 11A0	3271=	3272=	3274=	3275=	3285=	3286=	3287=	3288=
U 11A8	3301=	3302=	3316=	3317=	3319=	3320=	3324=	3325=
U 11B0	1844	1864	1865	1866	1867	1868	1869	1870
U 11B8	1880	1881	1882	1883	1884	1885	1886	1887
U 11C0	1888	1889	1890	1891	1892	1893	1894	1895
U 11C8	1896	1897	1898	1899	1900	1901	1903	1904
U 11D0	1936	1937	1943	1944	1945	1950	1951	1957
U 11D8	1958	1959	1960	1961	1962	1963	1964	1965
U 11E0	1966	1967	1968	1969	1970	1971	1972	1973
U 11E8	1974	1975	1976	1977	1978	1982	1988	1992
U 11F0	1998	2002	2006	2010	2020	2024	2046	2047
U 11F8	2048	2049	2050	2051	2015:	2016:	2017:	2018:
U 1200	2052	2053	2054	2055	2056	2057	2058	2059
U 1208	2060	2061	2062	2063	2064	2067	2068	2069
U 1210	2070	2071	2072	2073	2076	2077	2081	2082
U 1218	2083	2084	2085	2086	2087	2095	2096	2097
U 1220	2098	2100	2101	2102	2103	2105	2106	2108
U 1228	2109	2111	2112	2114	2115	2116	2118	2119
U 1230	2120	2122	2134	2138	2141	2142	2146	2149
U 1238	2150	2151	2152	2153	2154	2155	2156	2157
U 1240	2158	2165	2166	2167	2168	2169	2170	2171
U 1248	2172	2173	2223	2226	2229	2230	2233	2234
U 1250	2237	2238	2239	2240	2241	2244	2245	2246
U 1258	2247	2248	2249	2252	2253	2256	2261	2266
U 1260	2271	2272	2273	2281	2282	2287	2292	2293
U 1268	2294	2297	2302	2303	2308	2313	2314	2315
U 1270	2318	2323	2324	2329	2332	2333	2336	2337
U 1278	2338	2343	2402	2405	2406	2407	2408	2409
U 1280	2412	2413	2414	2415	2418	2419	2420	2421
U 1288	2424	2425	2428	2429	2430	2431	2432	2433
U 1290	2434	2437	2438	2439	2440	2441	2444	2445
U 1298	2446	2447	2448	2449	2452	2453	2454	2455
U 12A0	2456	2457	2458	2461	2462	2463	2464	2465
U 12A8	2466	2468	1929:	2469	2470	2471	2472	2473
U 12B0	2476	2477	2478	2481	2482	2483	2484	2487
U 12B8	2488	2489	2490	2491	2494	2495	2496	2497
U 12C0	2498	2499	2502	2505	2506	2507	2508	2509
U 12C8	2510	2569	2572	2573	2579	2582	2583	2584
U 12D0	2585	2588	2589	2590	2591	2594	2595	2598
U 12D8	2599	2600	2601	2602	2603	2604	2607	2608
U 12E0	2609	2610	2611	2614	2615	2616	2617	2618
U 12E8	2619	2622	2623	2624	2625	2626	2627	2628
U 12F0	2631	2632	2633	2634	2635	2636	2638	2639
U 12F8	2640	2641	2642	2643	2646	2647	2648	2651
U 1300	2652	2653	2654	2657	2658	2659	2660	2661
U 1308	2664	2665	2666	2667	2668	2669	2672	2673
U 1310	2674	2675	2678	2679	2680	2681	2682	

NE CCCCCCCCCCCCCCCCCCCC

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ESKAH2E.MCR

Line Number Index

MICRO2

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L 3

SEQ 0651
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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2851	2852	2855	2856	2857	2860	2861	2914
U 1350	2917	2920	2921	2924	2925	2928	2929	2930
U 1358	2935	2936	2937	2942	2943	2948	2951	2952
U 1360	2957	3012	3013	3016	3017	3018	3019	3020
U 1368	3021	3026	3027	3028	3030	3031	3039	3040
U 1370	3043	3052	3053	3057	3062	3063	3066	3075
U 1378	3076	3079	3080	3084	3087	3093	3144	3145
U 1380	3148	3149	3153	3154	3157	3160	3161	3162
U 1388	3163	3164	3165	3166	3167	3168	3173	3174
U 1390	3175	3176	3177	3178	3183	3184	3187	3188
U 1398	3189	3190	3191	3192	3193	3198	3199	3202
U 13A0	3205	3206	3207	3260	3261	3264	3265	3269
U 13A8	3270	3273	3276	3277	3278	3279	3280	3281
U 13B0	3282	3283	3284	3289	3290	3291	3292	3293
U 13B8	3294	3299	3300	3303	3304	3305	3306	3307
U 13C0	3308	3309	3314	3315	3318	3321	3322	3323
U 13C8	3326							
U 13D0 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

00000
00000


```
Total microwords used in memory U: 985
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

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ESKAH2E.MCR

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: The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH2E.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

ZZ-ESKAN-V132 Table of Contents

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```

: 3      Control ROM Field Definitions
: 548    Register Transfer Macro Definitions
: 1413   Non-transfer Functions
: 1485   Branch Enable Macro Definitions
: 1564   MICRO DIAGNOSTIC DEFINED MACROS
: 1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2211   TEST DF DUAL ADDRESSING TEST OF CACHE TAG STORE
: 2363   TEST E0 DUAL ADDRESSING TEST OF CACHE VALID BIT
: 2488   TEST E1 DUAL ADDRESSING TEST OF CACHE DATA MATRIX
: 2614   TEST E2 CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION
: 2751   TEST E3 MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY
: 2896   TEST E4 MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY

```

ZZ-ESKAH-V132 Subroutines
ESKAH2F.MCR

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```

;1          .NOLIST
;1804       .LIST
;1805

```

SEQ 0655
Page

[illegible]


```

:1806      TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      REGION/1000,13FF
:1808      +
:1809      FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
:1816      6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      R[OF] AND DO A RETURN.
:1819
:1820      IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      TO THE CONSOLE.
:1823
:1824      -
U 1100. 0000.003C.1980.0800.0084.7003 :1825 1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
U 1101. 0000.003C.0580.0800.0084.7001 :1826 1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
U 1102. 0000.003C.0980.0800.0084.7001 :1827 1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
U 1103. 0000.003C.0D80.0800.0084.7001 :1828 1103: SC_K[.3],J/TRPH0      : TB MODIFY
U 1104. 0000.003C.1180.0800.0084.7001 :1829 1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
U 1105. 0000.003C.0580.0800.0084.7001 :1830 1105: SC_K[.6],J/TRPH0      : TB MISS
U 1106. 0000.003C.0980.0800.0084.7001 :1831 1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
U 1107. 0000.003C.5D80.0800.0084.7001 :1832 1107: SC_K[.7],J/TRPH0      : TB PARITY
U 1108. 0000.003C.0180.0800.0084.7001 :1833 1108: SC_K[.8],J/TRPH0      : CACHE PARITY
U 110C. 0000.003C.8580.0800.0084.7003 :1834 110C: SC_K[.C],J/TRPH1      : RDS
U 110D. 0000.003C.8980.0800.0084.7003 :1835 110D: SC_K[.D],J/TRPH1      : TIME OUT
U 110E. 0000.003C.6580.0800.0084.7001 :1836 110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
U 110F. 0000.003C.6180.0800.0084.7003 :1837 110F: SC_K[.F],J/TRPH1     : CS PARITY
U 1001. 0000.003C.81F0.2C00.0000.1006 :1838 TRPH0: Q_ID[USTACK]
U 1006. 0C00.003C.01E0.0800.0000.100E :1839      Q-D,D,Q
U 100E. 0000.003C.8180.3C00.0000.1013 :1840      ID[USTACK],D
U 1013. 0C00.003C.01E0.0800.0000.1016 :1841      Q-D,D,Q
U 1016. 0000.003C.01C0.0A78.0000.101E :1842      Q-R[OF]
U 101E. 0001.2024.0180.0800.0010.103F :1843      ALU_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
U 103F. 0000.013C.0180.0800.0000.1002 :1844      Z?                          : BRANCH IF NO
U 1002. 0001.2036.0180.0AF8.0000.0000 :1845 =0      ALU_Q.AND.MASK,R[OF],ALU,RETURN : CLEAR THE BIT AND RETURN
:1846      +
:1847      THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      FAULT STATUS REGISTER
:1854      SBI ERROR REGISTER
:1855      TIMEOUT ADDRESS REGISTER
:1856      MAINTENANCE REGISTER
:1857      CACHE PARITY REGISTER
:1858      TB ERROR REGISTER 1
:1859      TB ERROR REGISTER 0
:1860      -

```

U 1003. 0018.0038.1D80.09E8.0000.1004 :1861
U 1004. 0000.003D.D980.0800.0084.7169 :1862
U 1005. 0000.003C.49F0.2C00.0000.104F :1863
U 104F. 0001.203C.4DF0.2DB0.0000.105B :1864
U 105B. 0001.203C.65F0.2DB8.0000.105F :1865
U 105F. 0001.203C.6DF0.2DD8.0000.1109 :1866
U 1109. 0001.203C.75F0.2DE0.0000.114B :1867
U 114B. 0001.203C.79F0.2DC8.0000.114C :1868
U 114C. 0001.203C.69F0.2DC0.0000.114D :1869
U 114D. 0001.203C.81F0.2DD0.0000.1000 :1870
U 1000. 0001.203D.0180.09F0.0000.1163 :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWTST
ERLOOP
ERROR1
ERROR2

U 114E. 0000.003C.65F8.0800.0084.714F :1880
U 114F. 0818.0038.8D80.0800.0000.1150 :1881
U 1150. 0D00.003C.0180.0800.0000.1151 :1882
U 1151. 0000.003C.3D80.3C00.0000.1152 :1883
U 1152. 0818.0038.0580.0800.0000.1153 :1884
U 1153. 0D00.003C.0180.0800.0000.1154 :1885
U 1154. 0F00.003C.3180.3C00.0000.1156 :1886
U 1156. 0000.003C.5D80.3C00.0000.1157 :1887
U 1157. 0000.003C.3980.3C00.0000.1158 :1888
U 1158. 0000.003C.2980.3C00.0000.1159 :1889
U 1159. 0000.003C.4980.3C00.0000.115A :1890
U 115A. 0818.0038.C180.0800.0000.115B :1891
U 115B. 0000.003C.6580.3C00.0000.115C :1892
U 115C. 0F00.003C.6D80.3C00.0000.115D :1893
U 115D. 0000.003C.6D80.3C00.0000.115E :1894
U 115E. 0000.003C.6580.3C00.0000.115F :1895
U 115F. 0003.003C.0180.09F0.0000.1160 :1896
U 1160. 0003.003C.0180.0AF8.0000.1161 :1897
U 1161. 0003.003C.0180.09E8.0000.105E :1898
U 1162. 0818.0038.0980.0800.0000.105E :1899
U 1163. 0810.0038.0180.0978.0000.1164 :1900
U 1164. 0819.0034.4D80.0800.0000.104E :1901
U 104E. 0819.0030.1180.0800.0000.105E :1902
U 1165. 0810.0038.0180.0978.0000.1166 :1903
U 1166. 0819.0034.4D80.0800.0000.105A :1904
U 105A. 0819.0030.D580.0800.0000.105E :1905

SCOPE: SC_K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_K[.1F] : ...
D-DAL.SC :
ID[PSL]_D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC :
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.[CS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.[CS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
D_K[.FFFF] :
ID[SBI.ERR]_D :
ID[FAULT]_D,D_0 :
ID[FAULT]_D :
ID[SBI.ERR]_D :
RC[0E] 0 :
RC[0F] 0 :
RC[0D] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E: :
CALLCON: ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

U 105E. 0000.003C.1D80.3C00.0000.105E :1908

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

U 13F0. 0000.003C.0180.0800.0000.13F1 :1912
U 13F1. 0000.003C.0180.0800.0000.13F2 :1913
U 13F2. 0000.003C.0180.0800.0000.13F3 :1914
U 13F3. 0000.003C.0180.0800.0000.13F4 :1915

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

U 13F4. 0000.003C.0180.0800.0000.13F5 :1916
U 13F5. 0000.003C.0180.0800.0000.13F6 :1917
U 13F6. 0000.003C.0180.0800.0000.13F7 :1918
U 13F7. 0000.003C.0180.0800.0000.13F8 :1919
U 13F8. 0000.003C.0180.0800.0000.13F9 :1920
U 13F9. 0000.003C.0180.0800.0000.13FA :1921
U 13FA. 0000.003C.0180.0800.0000.13FB :1922
U 13FB. 0000.003C.0180.0800.0000.13FC :1923
U 13FC. 0000.003C.0180.0800.0000.13FD :1924
U 13FD. 0000.003C.0180.0800.0000.13FE :1925
U 13FE. 0000.003C.0180.0800.0000.13FF :1926
U 13FF. 0000.003C.0180.0800.0000.1155 :1927
U 1155. 0000.003C.0180.0800.0000.12AA :1928
U 12AA. 0000.003C.0180.0800.0000.1167 :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 1167. 0810.0038.4D80.0978.0000.1168 :1936
U 1168. 0019.4016.4D80.09F8.0000.0001 :1937
:1938
:1939
:1940
:1941
:1942
U 1169. 0010.0038.01C0.0978.0000.116A :1943
U 116A. 0019.2034.4DC0.0800.0000.116B :1944
U 116B. 0019.2032.1D80.09F8.0000.0001 :1945
:1946
:1947
:1948
:1949
U 116C. 0018.0038.C180.0800.0000.116D :1950
U 116D. 0500.003C.0380.0800.0000.100C :1951
U 100C. 0000.003D.0180.0800.0000.1183 :1952
U 100D. 0000.003C.0180.0800.0000.1014 :1953
U 1014. 0000.003D.0180.0800.0000.1184 :1954
U 1015. 0000.003E.0180.0800.0000.0001 :1955
:1956
U 116E. 0118.0038.1B80.0800.0000.1186 :1957
U 116F. 0118.0038.0B80.0800.0000.1186 :1958
U 1170. 0118.0038.0780.0800.0000.1186 :1959
U 1171. 0118.0038.C380.0800.0000.1186 :1960
U 1172. 0018.0038.1980.0800.0000.116E :1961
U 1173. 0018.0038.1980.0800.0000.116F :1962
U 1174. 0018.0038.1980.0800.0000.1170 :1963
U 1175. 0018.0038.1980.0800.0000.1171 :1964
U 1176. 0018.0038.0980.0800.0000.116E :1965
U 1177. 0018.0038.0980.0800.0000.116F :1966
U 1178. 0018.0038.0980.0800.0000.1170 :1967
U 1179. 0018.0038.0980.0800.0000.1171 :1968
U 117A. 0018.0038.0580.0800.0000.116E :1969
U 117B. 0018.0038.0580.0800.0000.116F :1970

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

+ THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
TYPING IT.

-
SUBTST: D RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1

+ THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.

-
SETRCF: Q RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
CERTAIN TRAPS.

DC.1DE: ALU_K[.FFFF]
D D-LEFT,S1/7
=0 CALL,J/DCD
NOP
=0 CALL,J/DCE
RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D D-LEFT2,S1/7,J/SX
S01: ALU_K[.2],D D-LEFT2,S1/7,J/SX
S10: ALU_K[.1],D D-LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D D-LEFT2,S1/7,J/SX
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01


```
U 1180, 0018,0038,0580,0800,0000,1170 :1971 DCA: ALU_K[.1],J/S10
U 1181, 0018,0038,0580,0800,0000,1171 :1972 DCB: ALU_K[.1],J/S11
U 1182, 0018,0038,C180,0800,0000,116E :1973 DCC: ALU_K[.FFFF],J/S00
U 1183, 0018,0038,C180,0800,0000,116F :1974 DCD: ALU_K[.FFFF],J/S01
U 1184, 0018,0038,C180,0800,0000,1170 :1975 DCE: ALU_K[.FFFF],J/S10
U 1185, 0018,0038,C180,0800,0000,1171 :1976 DCF: ALU_K[.FFFF],J/S11
U 1186, 0100,003E,0380,0800,0000,0001 :1977 SX: D_D.LEFT2,SI/7,RETURN1
U 1187, 0018,0038,01C0,0800,0000,101C :1978 DC.5: Q_K[.8]
:1979 =0
U 101C, 0000,003D,0180,0800,0000,1177 :1980 DC.5A: CALL,J/DC5
U 101D, 0019,2000,05C0,0800,0010,1188 :1981 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1188, 0000,013C,0180,0800,0000,1044 :1982 Z?
U 1044, 0000,003C,0180,0800,0000,101C :1983 =0 J/DC.5A
U 1045, 0000,003E,0180,0800,0000,0001 :1984 RETURN1
:1985 =0
U 1046, 0000,003D,0180,0800,0000,1187 :1986 DC.A: CALL,J/DC.5
U 1047, 0500,003E,0180,0800,0000,0001 :1987 D_D.LEFT,SI/ZERO,RETURN1
U 1189, 0018,0038,01C0,0800,0000,1048 :1988 DC.9: Q_K[.8]
:1989 =0
U 1048, 0000,003D,0180,0800,0000,117B :1990 DC.9A: CALL,J/DC9
U 1049, 0019,2000,05C0,0800,0010,118A :1991 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 118A, 0000,013C,0180,0800,0000,104A :1992 Z?
U 104A, 0000,003C,0180,0800,0000,1048 :1993 =0 J/DC.9A
U 104B, 0000,003E,0180,0800,0000,0001 :1994 RETURN1
:1995 =0
U 104C, 0000,003D,0180,0800,0000,1189 :1996 DC.C: CALL,J/DC.9
U 104D, 0018,0038,C180,0800,0000,118B :1997 ALU_K[.FFFF]
U 118B, 0600,003E,0380,0800,0000,0001 :1998 D_D.RIGHT,SI/7,RETURN1
:1999 =0
U 1050, 0000,003D,0180,0800,0000,1189 :2000 DC.6: CALL,J/DC.9
U 1051, 0018,0038,0580,0800,0000,118C :2001 ALU_K[.1]
U 118C, 0100,003E,0380,0800,0000,0001 :2002 D_D.LEFT2,SI/7,RETURN1
:2003 =0
U 1052, 0000,003D,0180,0800,0000,1189 :2004 DC.3: CALL,J/DC.9
U 1053, 0018,0038,C180,0800,0000,118D :2005 ALU_K[.FFFF]
U 118D, 0500,003E,0380,0800,0000,0001 :2006 D_D.LEFT,SI/7,RETURN1
:2007 ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
:2008 ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
:2009 ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 118E, 0000,003F,0180,0800,0000,117C :2010 TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001 :2011 117C: RETURN1
U 117D, 0000,003E,0180,0800,0000,0002 :2012 117D: RETURN2
U 117E, 0000,003E,0180,0800,0000,0003 :2013 117E: RETURN3
U 117F, 0000,003E,0180,0800,0000,0004 :2014 117F: RETURN4
U 11FC, 0000,003D,0180,0800,0000,1163 :2015 11FC: ERROR1
U 11FD, 0000,003D,0180,0800,0000,1163 :2016 11FD: ERROR1
U 11FE, 0000,003D,0180,0800,0000,1163 :2017 11FE: ERROR1
U 11FF, 0000,003D,0180,0800,0000,1163 :2018 11FF: ERROR1
:2019 ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.
U 118F, 0F18,0038,5DC0,0800,0000,1054 :2020 DCLA: D_0,Q_K[.7]
:2021 =0
U 1054, 0000,003D,0180,0800,0000,1180 :2022 DCLA1: CALL,J/DCA
U 1055, 0001,203C,0180,0800,0010,1190 :2023 ALU_Q,CLK.UBCC
U 1190, 0000,013C,0180,0800,0000,1056 :2024 Z?
U 1056, 0019,2000,05C0,0800,0000,1054 :2025 =0 Q_Q-K[.1],J/DCLA1
```



```
U 1057, 0000,003E,0180,0800,0000,0001 :2026 RETURN1
:2027 ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
:2028 ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
:2029 ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
:2030 ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
:2031 ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
:2032 ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
:2033 ; WILL CONTAIN THE READ DATA.
:2034 =0
U 1058, 0F00,003D,0180,0800,0000,1178 :2035 RHOM1: D 0,CALL,J/DC6
U 1059, 0000,003C,0180,0800,0000,1063 :2036 J7READ
:2037 =0
U 105C, 0F00,003D,0180,0800,0000,1174 :2038 RHOM1: D 0,CALL,J/DC2
U 105D, 0000,003C,0180,0800,0000,1063 :2039 J7READ
:2040 =0
U 1060, 0F00,003D,0180,0800,0000,1176 :2041 RMOM1: D 0,CALL,J/DC4
U 1061, 0000,003C,0180,0800,0000,1063 :2042 J7READ
:2043 =0
U 1062, 0F00,003C,0180,0800,0000,1063 :2044 RMOM1: D 0,J/READ
U 1063, 0000,003C,01F8,0800,0084,7191 :2045 SC K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
U 1191, 0D00,003C,0180,0800,0000,1192 :2046 D DAL,SC
U 1192, 0001,003C,0180,09E8,0000,1193 :2047 RC[OD] D
U 1193, 0000,003C,0180,0A70,0000,1194 :2048 LAB R[OE]
U 1194, 0000,003C,0180,52F8,0000,1195 :2049 R[OF] LA,FS/MCT,MCT/READ.V.WCHK
U 1195, 0001,003C,0180,09D0,0000,1196 :2050 RC[OA] D
U 1196, 0000,003C,75F0,2C00,0000,1197 :2051 Q_ID[MAINT]
U 1197, 0800,003C,0180,0A78,0000,1198 :2052 D-R[OF]
U 1198, 0003,003C,0180,0AF8,0000,1199 :2053 R[OF] 0
U 1199, 0001,203C,0180,09E0,0000,119A :2054 RC[OC] Q
U 119A, 0000,003C,01C0,0A70,0000,119B :2055 Q R[OE]
U 119B, 0001,003C,0180,09C8,0000,119C :2056 RC[9] D
U 119C, 001D,2000,0180,0800,0010,119D :2057 ALU_Q=D,CLK.UBCC
U 119D, 0000,013C,0180,0800,0000,1064 :2058 Z?
U 1064, 0000,003C,0180,0800,0000,11A4 :2059 =0 J/RERR
U 1065, 0818,0038,D5F8,0800,0000,119E :2060 Q 0,D,K[.6]
U 119E, 0000,003C,0180,0800,0084,719F :2061 SC K[.8]
U 119F, 0D10,0038,01C0,0960,0000,11A0 :2062 D DAL,SC,Q RC[OC]
U 11A0, 001D,2034,01C0,0800,0000,11A1 :2063 A[U,Q[AND]]D,Q_ALU
U 11A1, 0810,0038,0180,0968,0000,11A2 :2064 D RC[OD]
U 11A2, 001D,2000,0180,0800,0010,11A3 :2065 A[U,Q-D,CLK.UBCC
U 11A3, 0000,013C,0180,0800,0000,1066 :2066 Z?
U 1066, 0000,003E,0180,0800,0000,0002 :2067 =0 RETURN2
U 1067, 0810,003A,0180,0950,0000,0003 :2068 D RC[OA],RETURN3
U 11A4, 0000,003C,79F0,2C00,0000,11A5 :2069 RERR: Q_ID[PARITY]
U 11A5, 0001,203E,0180,09E8,0000,0001 :2070 RC[OD]_Q,RETURN1
:2071 ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
:2072 ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
:2073 ; ELSE RETURN2.
U 11A6, 0000,003C,0180,0A70,0000,11A7 :2074 WRITE: LAB R[OE]
U 11A7, 0000,003C,0180,32F8,0000,11A8 :2075 R[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
U 11A8, 0800,003C,0180,0A78,0000,11A9 :2076 D R[OF]
U 11A9, 0003,003C,0180,0AF8,0000,11AA :2077 R[OF] 0
U 11AA, 0000,003C,01C0,0A70,0000,11AB :2078 Q R[OE]
U 11AB, 001D,2000,0180,0800,0010,11AC :2079 A[U,Q-D,CLK.UBCC
U 11AC, 0000,013C,0180,0800,0000,1068 :2080 Z?
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U 1068, 0000,003C,0180,0800,0000,11A4 :2081 =0 J/RERR ; UTRAPPED.
U 1069, 0000,003E,0180,0800,0000,0002 :2082 RETURN2 ; OK NO UTRAP.
:2083 ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
:2084 ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
:2085 ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
:2086 ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
:2087 ; DISSABLE SBI CYCLES:
U 11AD, 0F00,003C,0180,0800,0000,11AE :2088 SOFF: D 0
U 11AE, 0000,003C,8580,0800,0084,71AF :2089 S1: SC K[C]
U 11AF, 0801,001C,0180,0800,0000,11B0 :2090 ALU D.ORNOT.MASK,D,ALU
U 11B0, 0000,003E,7580,3C00,0000,0001 :2091 ID[MAINT] D,RETURN2
:2092 ; SET FORCE REPLACE GROUP ZERO BIT
U 11B1, 0F00,003C,0180,0800,0000,11B2 :2093 ROS: D 0
U 11B2, 0000,003C,6180,0800,0084,71B3 :2094 S2: SC K[F]
U 11B3, 0000,003C,0580,0800,0084,81B4 :2095 SC SC-K[.1]
U 11B4, 0801,001C,0180,0800,0000,11AE :2096 S3: ALU D.ORNOT.MASK,D,ALU,J/S1
:2097 ; SET FORCE REPLACE GROUP T BIT
U 11B5, 0F00,003C,0180,0800,0000,11B6 :2098 R1S: D 0
U 11B6, 0000,003C,8980,0800,0084,71B4 :2099 S4: SC K[D],J/S3
:2100 ; SET FORCE MISS GROUP 0 BIT
U 11B7, 0F00,003C,0180,0800,0000,11B8 :2101 MOS: D 0
U 11B8, 0000,003C,6580,0800,0084,71B4 :2102 S5: SC K[.10],J/S3
:2103 ; SET FORCE MISS GROUP 1 BIT
U 11B9, 0F00,003C,0180,0800,0000,11BA :2104 M1S: D 0
U 11BA, 0000,003C,6180,0800,0084,71B4 :2105 S6: SC K[F],J/S3
:2106 ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 11BB, 0F00,003C,0180,0800,0000,11BC :2107 M1OS: D 0
U 11BC, 0000,003C,6180,0800,0084,71BD :2108 SC K[F]
U 11BD, 0801,001C,0180,0800,0000,11B8 :2109 S7: ALU D.ORNOT.MASK,D,ALU,J/S5
:2110 ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 11BE, 0F00,003C,0180,0800,0000,11BF :2111 ROM1S: D 0
U 11BF, 0000,003C,6180,0800,0084,71C0 :2112 SC K[F]
U 11C0, 0801,001C,0180,0800,0000,11B2 :2113 ALU D.ORNOT.MASK,D,ALU,J/S2
:2114 ; SET FORCE REPLACE GROUP T FORCE MISS GROUP 0 BITS
U 11C1, 0F00,003C,8980,0800,0084,71BD :2115 R1MOS: D 0,SC K[D],J/S7
:2116 ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
:2117 ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
:2118 ; THESE PATTERNS IN THE RC SCRATCH PADS.
:2119 RC[0] AAAAAAAA
:2120 RC[1] 19999000
:2121 RC[2] 55555555
:2122 RC[3] 06666000
:2123 RC[4] 99999999
:2124 RC[5] 1B6DB000
:2125 RC[6] 66666666
:2126 RC[7] 04924000
U 11C2, 0F18,0038,5DC0,0800,0000,106A :2127 CAPAT: Q_K[.7],D_0
:2128 =0
U 106A, 0000,003D,0180,0800,0000,1180 :2129 CAP1: CALL,J/DCA
U 106B, 0001,203C,0180,0800,0010,11C3 :2130 ALU_Q,CLK.UBCC
U 11C3, 0000,013C,0180,0800,0000,106C :2131 Z?
U 106C, 0019,2000,05C0,0800,0000,106A :2132 =0 Q_Q-K[.1],J/CAP1
U 106D, 0001,003C,0180,0980,0000,11C4 :2133 RC[0] D
U 11C4, 0001,0028,0180,0990,0000,11C5 :2134 ALU NOT.D,RC[2],ALU
U 11C5, 0F18,0038,5DC0,0800,0000,106E :2135 Q_K[.7],D_0

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U 106E, 0000,003D,0180,0800,0000,117B :2136
U 106F, 0001,203C,0180,0800,0010,11C6 :2137
U 11C6, 0000,013C,0180,0800,0000,1070 :2138
U 1070, 0019,2000,05C0,0800,0000,106E :2139
U 1071, 0001,003C,0180,09A0,0000,11C7 :2140
U 11C7, 0001,0028,0180,0980,0000,11C8 :2141
U 11C8, 0000,003C,89F8,0800,0084,71C9 :2142
U 11C9, 0D00,003C,0180,0800,0000,11CA :2143
U 11CA, 0600,003C,0180,0800,0000,11CB :2144
U 11CB, 0001,003C,0180,0988,0000,11CC :2145
U 11CC, 0810,0038,65F8,0930,0084,71CD :2146
U 11CD, 0D00,003C,0180,0800,0000,11CE :2147
U 11CE, 0200,003C,0180,0800,0000,11CF :2148
U 11CF, 0200,003C,0180,0800,0000,11D0 :2149
U 11D0, 0F01,003C,0180,0998,0000,1072 :2150
U 1072, 0000,003D,0180,0800,0000,117B :2151
U 1073, 0100,003C,0180,0800,0000,1074 :2152
U 1074, 0000,003D,0180,0800,0000,117B :2153
U 1075, 0500,003C,0180,0800,0000,1076 :2154
U 1076, 0000,003D,0180,0800,0000,1176 :2155
U 1077, 0001,0028,0180,09A8,0000,11D1 :2156
U 11D1, 0000,003C,85F8,0800,0084,71D2 :2157
U 11D2, 0D00,003C,0180,0800,0000,11D3 :2158
U 11D3, 0001,003C,0180,0988,0000,11D4 :2159
U 11D4, 0810,0038,0180,0928,0000,11D5 :2160
U 11D5, 0000,003C,61F8,0800,0084,71D6 :2161
U 11D6, 0D00,003C,0180,0800,0000,11D7 :2162
U 11D7, 0200,003C,0180,0800,0000,11D8 :2163
U 11D8, 0600,003C,0180,0800,0000,11D9 :2164
U 11D9, 0001,003E,0180,09A8,0000,0001 :2165

=0
CAP2: CALL,J/DC9
ALU_Q,CLK.UBCC
Z?
=0 Q Q-K[.1],J/CAP2
R[4] D
ALU_NOT.D,R[6]_ALU
Q_0,SC_K[.D]
D_DAL.SC
D_D.RIGHT,SI/ZERO
R[1] D
D_RC[6],SC_K[.10],Q_0
D_DAL.SC
D_D.RIGHT2,SI/ZERO
D_D.RIGHT2,SI/ZERO
R[3] D,D_0
=0 CALL,J/DC9
D_D.LEFT2,SI/ZERO
=0 CALL,J/DC9
D_D.LEFT,SI/ZERO
=0 CALL,J/DC4
ALU_NOT.D,R[5]_ALU
SC_K[.C],Q_0
D_DAL.SC
R[7] D
D_RC[5]
SC_K[.F],Q_0
D_DAL.SC
D_D.RIGHT2,SI/ZERO
D_D.RIGHT,SI/ZERO
R[5]_D,RETURN1

THE FOLLOWING SUBROUTINE GENERATES CONSTANTS AND SAVES THEM IN THE RA
SCRATCH PADS. FOLLOWING ARE THE CONSTANTS GENERATED:

R[2] = FORCE REPLACE GROUP 1 AND FORCE MISS GROUP 0
R[3] = R[6] PLUS DISABLE SBI CYCLE
R[4] = CPU ADDRESS FOR AUTO REFILL (0)
R[5] = IB ADDRESS FOR AUTO REFILL (3FC)
R[6] = FORCE REPLACE GROUP 0 AND FORCE MISS GROUP 1
R[7] = GROUP 0 AND GROUP 1 MATCH BIT MASK
R[8] = GROUP 0 MATCH BIT
R[9] = GROUP 1 MATCH BIT
R[A] = R[6] PLUS REVERSE PARITY GROUP 0, BYTE 0 (DATA)
R[B] = TIMEOUT ADDRESS (= 01000000)
R[C] = SILO COUNTER MASK
R[D] = ADDRESS TO FORCE RDS (4020)
R[E] = ADDRESS OF MEMORY CONFIGURATION REGISTER B

REGISTERSETUP:

U 11DA, 0003,003C,0180,0AA0,0000,1078 :2185
U 1078, 0818,0039,5580,0800,0000,1182 :2186
U 1079, 0001,003C,0180,0AA8,0000,107A :2187
U 107A, 0818,0039,7580,0800,0000,1172 :2188
U 107B, 0001,003C,0180,0AC0,0000,11DB :2189

=0 R[4]_0
D_K[.3F],CALL,J/DCC : GENERATE 3FC
R[5] D : SAVE
=0 D_K[.20],CALL,J/DCC : GENERATE 200(X)
R[8]_D : GROUP 0 MATCH BIT

U 11DB.	0501,003C,0180,0AB8,0000,11DC	:2191	R[7]_D,D_D.LEFT	: PART OF MASK
U 11DC.	0001,003C,0180,0AC8,0000,11DD	:2192	R[9]_D	: GROUP 1 MATCH BIT
U 11DD.	0000,003C,0180,0A38,0000,11DE	:2193	LAB R[7]	
U 11DE.	001C,2030,0180,0AB8,0000,11DF	:2194	R[7]_LA.OR.D	: COMPLETE THE MASK
U 11DF.	0100,003C,0180,0800,0000,11E0	:2195	D_D.LEFT2	
U 11E0.	0500,003C,0180,0800,0000,11E1	:2196	D_D.LEFT	: GENERATE FR GRO AND FM GR1
U 11E1.	0501,003C,0180,0A90,0000,11E2	:2197	R[2]_D,D_D.LEFT	
U 11E2.	0500,003C,01E0,0800,0000,11E3	:2198	Q D,D_D.LEFT	
U 11E3.	081D,0030,01E0,0AB0,0000,11E4	:2199	R[6]_D.OR.Q,D_ALU,Q_D	: ...
U 11E4.	0000,003C,7580,3C00,0000,11E5	:2200	ID[MAINT]_D	: SAVE
U 11E5.	0000,003C,8580,0800,0084,71E6	:2201	SC K[C]	: SETUP THE MAINTENANCE REGISTER
U 11E6.	0801,001C,0180,0800,0000,11E7	:2202	D_D.ORNOT.MASK	: SETUP TO GENERATE BIT 12
U 11E7.	0001,003C,0180,0A98,0000,11E8	:2203	R[3]_D	: INSERT BIT 12
U 11E8.	0C00,003C,0180,0A10,0000,11E9	:2204	LAB R[2],D_Q	: SAVE
U 11E9.	0500,003C,0180,0800,0000,11EA	:2205	D_D.LEFT	: COMPLETE DATA FOR R2
U 11EA.	001C,2030,0180,0A90,0000,11EB	:2206	R[2]_LA.OR.D	
U 11EB.	0818,0038,5180,0800,0000,11EC	:2207	D K[1E]	: GENERATE CONSTANT FOR R[A]
U 11EC.	0000,003C,65F8,0800,0084,71ED	:2208	SC K[10],Q 0	: ...
U 11ED.	0D00,003C,01C0,0A30,0000,11EE	:2209	D DAL.SC,Q R[6]	: ...
U 11EE.	001D,0032,0180,0AD0,0000,0001	:2210	R[0A]_D.OR.Q,RETURN1	: SAVE


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.2211 .PAGE 'TEST DF DUAL ADDRESSING TEST OF CACHE TAG STORE'
.2212 *****
.2213 ++
.2214
.2215 TEST DF DUAL ADDRESSING TEST OF CACHE TAG STORE
.2216
.2217 TEST DESCRIPTION
.2218
.2219 THIS TEST DOES A CURSORY CHECK OF THE ADDRESS LINES ON THE
.2220 CACHE ADDRESS MATRIX. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
.2221
.2222 1) VALIDATE LOC 0 3) VALIDATE LOC 10
.2223 VALIDATE LOC 1FFFF008 VALIDATE LOC 1FFFF020
.2224 CHECK LOC 0 CHECK LOC 10
.2225
.2226 2) VALIDATE LOC 8
.2227 VALIDATE LOC 1FFFF010
.2228 CHECK LOC 8
.2229 CHECK LOC 0 4) ETC...
.2230
.2231 THE CHECK IS MADE BY LOOKING AT THE HIT/MISS BIT TO ENSURE THAT
.2232 THE LOCATION IS A HIT.
.2233
.2234 SUBTEST 1 - CHECK CACHE GROUP 0
.2235
.2236 SUBTEST 2 - CHECK CACHE GROUP 1
.2237
.2238 LOGIC DESCRIPTION
.2239
.2240 THIS TEST CHECKS THE ADDRESS LINES TO THE CACHE TAG STORE CHIPS
.2241 ON THE CAM MODULE.
.2242
.2243 ERROR DESCRIPTION
.2244
.2245 DATA: ADDRESS VALIDATED AS ONE'S (1FFFF008, 1FFFF010, 1FFFF020, ETC.)
.2246 ADDRESS BEING CHECK FOR A HIT (0, 8, 10, 20, 40, ETC.)
.2247
.2248 ID[PARITY]
.2249 --
.2250 *****
.2251 =0
.2252 T001: NEWTST
.2253 RC[OF] K[.3]
.2254 =0 CALL J7REGISTERSETUP ; SETUP SOME REGISTERS
.2255 D_R[3] ; GET MAINT REG DATA
.2256 ID[MAINT] D
.2257 ://///////////////
.2258 +
.2259 CHECK GROUP 0 (MAINT REG IS SETUP TO FORCE MISS GROUP 1 AND FORCE
.2260 REPLACE GROUP 0)
.2261 -
.2262 =0 SUBTEST
.2263 D_K[.FFFF] ; GENERATE INITIAL ADDRESS
.2264 D_D.LEFT, SC_K[.C] ; THAT IS BEING WRITTEN WITH
.2265 D_D.OR.K[.1],Q_0 ; ONE'S
```

```
U 107C, 0000,003D,0180,0800,0000,114E
U 107D, 0018,0038,0D80,09F8,0000,107E
U 107E, 0000,003D,0180,0800,0000,11DA
U 107F, 0800,003C,0180,0A18,0000,11EF
U 11EF, 0000,003C,7580,3C00,0000,1080
```

```
U 1080, 0000,003D,0180,0800,0000,1167
U 1081, 0818,0038,C180,0800,0000,11F0
U 11F0, 0500,003C,8580,0800,0084,71F1
U 11F1, 0819,0030,05F8,0800,0000,11F2
```

```

U 11F2, 0D00,003C,0180,0800,0000,11F3 :2266      D DAL,SC
U 11F3, 0019,0030,0180,09F0,0000,11F4 :2267      RC[OE]_D.OR.K[.8]
U 11F4, 0003,003C,0180,0A80,0000,1082 :2268      RC[0]_0
U 1082, 0818,0039,4980,0800,0000,1185 :2269      D K[.FF],CALL[DCF]
U 1083, 0001,003C,0180,0980,0000,1084 :2270      RC[0]_D
U 1084, 0000,003D,0180,0800,0000,1162 :2271      ERLOOP
U 1085, 0000,003C,0180,0A00,0200,11F5 :2272      LOOPA: VA ALU,ALU RC[0]
U 11F5, 0000,003C,0180,9800,0000,11F6 :2273      MCT/VALIDATE
U 11F6, 0010,0038,0180,0970,0200,11F7 :2274      VA ALU,ALU RC[OE]
U 11F7, 0000,003C,0180,9800,0000,11F8 :2275      MCT/VALIDATE
U 11F8, 0010,0038,01C0,0970,0000,11F9 :2276      Q_RC[OE]
U 11F9, 0011,2034,01C0,0900,0000,11FA :2277      Q_Q.AND.RC[0]
U 11FA, 0000,003C,0180,0800,0000,11FB :2278      LOOPB: Q_Q.RIGHT
U 11FB, 0019,2024,5DC0,09E8,0200,1200 :2279      Q_Q.ANDNOT.K[.7],VA_ALU,RC[0D]_ALU ; MASK
U 1200, 0000,003C,0180,0800,0084,7201 :2280      SC K[.8]
U 1201, 0003,001C,0180,0AF8,0000,1202 :2281      RC[0F] NOT.MASK
U 1202, 0000,003C,0180,C800,0000,1203 :2282      D[LONG] CACHE.P
U 1203, 0000,003C,79F0,2C00,0000,1204 :2283      Q_ID[PARITY]
U 1204, 0001,203C,0180,09E0,0000,1205 :2284      RC[0C]_Q
U 1205, 0000,003C,0180,0A78,0010,1206 :2285      ALU_RC[0F],CLK.UBCC
U 1206, 0000,013C,0180,0800,0000,1086 :2286      Z?
U 1086, 0000,003C,0180,0800,0000,1089 :2287      =0 J/LOOPB1
U 1087, 0000,003C,0180,0800,0000,1088 :2288      NOP
U 1088, 0000,003D,0180,0800,0000,1165 :2289      =0 ERROR2
U 1089, 0000,003C,75F0,2C00,0000,1207 :2290      LOOPB1: Q_ID[MAINT]
U 1207, 001C,0034,01C0,0A40,0010,1208 :2291      Q_Q.AND.R[8],CLK.UBCC
U 1208, 0000,013C,0180,0800,0000,108A :2292      Z?
U 108A, 0000,003C,0180,0800,0000,108D :2293      =0 J/HITGO
U 108B, 0000,003C,0180,0800,0000,108C :2294      NOP
U 108C, 0000,003D,0180,0800,0000,1165 :2295      =0 ERROR2
U 108D, 0010,0038,0180,0968,0010,1209 :2296      HITGO: ALU_RC[0D],CLK.UBCC
U 1209, 0000,013C,0180,0800,0000,108E :2297      Z?
U 108E, 0010,0038,01C0,0968,0000,11FA :2298      =0 Q_RC[0D],J/LOOPB
U 108F, 0810,0038,0180,0970,0000,120A :2299      D_RC[OE]
U 120A, 0811,0034,01C0,0900,0000,120B :2300      D_D[AND]RC[0],Q_ALU
U 120B, 0001,003C,0180,0A80,0000,120C :2301      RC[0]_D
U 120C, 081D,0014,0180,0800,0000,120D :2302      D_D+Q
U 120D, 0010,0038,01C0,0970,0000,120E :2303      Q_RC[OE]
U 120E, 0011,2024,01C0,0900,0000,120F :2304      Q_Q.ANDNOT.RC[0]
U 120F, 001D,0030,0180,09F0,0000,1210 :2305      RC[OE]_D.OR.Q
U 1210, 0011,0034,0180,0900,0010,1211 :2306      ALU_D[AND]RC[0],CLK.UBCC
U 1211, 0000,013C,0180,0800,0000,1090 :2307      Z?
U 1090, 0000,003C,0180,0800,0000,1085 :2308      =0 J/LOOPA
U 1091, 0000,003C,0180,0800,0000,1092 :2309      NOP
:2310      :////////////////////
:2311      :+
:2312      : NOW CHECK GROUP 1
:2313      :-
U 1092, 0000,003D,0180,0800,0000,1167 :2314      =0 SUBTEST
U 1093, 0800,003C,8580,0A10,0084,7212 :2315      D_R[2],SC_K[.C]
U 1212, 0801,001C,0180,0800,0000,1213 :2316      D_D.ORNOT.MASK
U 1213, 0000,003C,7580,3C00,0000,1214 :2317      ID[MAINT]_D
U 1214, 0818,0038,C180,0800,0000,1215 :2318      D_K[.FFFF]
U 1215, 0500,003C,8580,0800,0084,7216 :2319      D_D.LEFT,SC_K[.C]
U 1216, 0819,0030,05F8,0800,0000,1217 :2320      D_D.OR.K[.1],Q_0
    
```

```

: EQUALS 1FFFF008(X)
: INIT ADDRESS TO WRITE ZERO'S
: GENERATE MASK FOR THE ADDRESS
: FIELD OF THE PHYSICAL ADDRESS
: LOAD ADDRESS TO WRITE ZERO'S
: MAKE IT A HIT
: LOAD ADDRESS TO WRITE ONE'S
: MAKE IT A HIT
: GENERATE ADDRESS TO CHECK
: ...
: ...
: SET BIT TO CATCH PARITY TRAP
: CHECK FOR A HIT AT OLD ADDRESSES
: CACHE PARITY UTRAP?
: CACHE PARITY UTRAP OCCURRED
: READ THE HIT/MISS BITS
: CHECK FOR A HIT IN GROUP 0
: BRANCH IF NO HIT
: DUAL ADDRESSING PROBLEM
: DONE CHECKING?
: BRANCH IF YES
: CHECK THE NEXT ADDRESS
: GET ADR WRITTEN AS ONE'S
: GET THE TAG PART ONLY
: SET NEW ADDRESS TO WRITE AS ZERO'S
: SHIFT THE TAG BIT LEFT
: NOW INSERT THE NEW TAG
: INTO THE ALL ONE'S PATTERN
: ...
: DONE WITH TEST?
: CONTINUE WITH NEXT ADDRESS
    
```

U 1217.	0D00,003C,0180,0800,0000,1218	:2321	D DAL.SC		
U 1218.	0019,0030,0180,09F0,0000,1219	:2322	RC[OE] D.OR.K[.8]		: EQUALS 1FFFF008(X)
U 1219.	0003,003C,0180,0A80,0000,1094	:2323	R[0] 0		: INIT ADDRESS TO WRITE ZERO'S
U 1094.	0000,003D,0180,0800,0000,1162	:2324	ERLOOP		
U 1095.	0000,003C,0180,0A00,0200,121A	:2325	LOOPC: VA ALU,ALU,R[0]		: LOAD ADDRESS TO WRITE ZERO'S
U 121A.	0000,003C,0180,9800,0000,121B	:2326	MCT/VALIDATE		: MAKE IT A HIT
U 121B.	0010,0038,0180,0970,0200,121C	:2327	VA ALU,ALU,RC[OE]		: LOAD ADDRESS TO WRITE ONE'S
U 121C.	0000,003C,0180,9800,0000,121D	:2328	MCT/VALIDATE		: MAKE IT A HIT
U 121D.	0010,0038,01C0,0970,0000,121E	:2329	Q RC[OE]		: GENERATE ADDRESS TO CHECK
U 121E.	0011,2034,01C0,0900,0000,121F	:2330	Q Q.AND.RC[0]		: ...
U 121F.	0000,003C,0180,0800,0000,1220	:2331	LOOPD: Q Q.RIGHT		: ...
U 1220.	0019,2024,5DC0,09E8,0200,1221	:2332	Q Q.ANDNOT.K[.7],VA_ALU,RC[OD],ALU		: MASK
U 1221.	0000,003C,0180,0800,0084,7222	:2333	SC K[.8]		: SET BIT FOR TRAP CATCHER
U 1222.	0003,001C,0180,0AF8,0000,1223	:2334	RC[OF] NOT.MASK		: ...
U 1223.	0000,003C,0180,C800,0000,1224	:2335	D[LONG] CACHE.P		: CHECK FOR A HIT AT OLD ADDRESSES
U 1224.	0000,003C,79F0,2C00,0000,1225	:2336	Q ID[PARITY]		
U 1225.	0001,203C,0180,09E0,0000,1226	:2337	RC[OC] Q		
U 1226.	0000,003C,0180,0A78,0010,1227	:2338	ALU_R[OF],CLK.UBCC		: SEE IF CACHE PARITY TRAPPED
U 1227.	0000,013C,0180,0800,0000,1096	:2339	Z?		
U 1096.	0000,003C,0180,0800,0000,1099	:2340	=0 J/LOOPD1		: NO CACHE PARITY TRAP
U 1097.	0000,003C,0180,0800,0000,1098	:2341	NOP		
U 1098.	0000,003D,0180,0800,0000,1165	:2342	=0 ERROR2		: A CACHE PARITY TRAP OCCURRED
U 1099.	0000,003C,75F0,2C00,0000,1228	:2343	LOOPD1: Q ID[MAINT]		: READ THE HIT/MISS BITS
U 1228.	001C,0034,01C0,0A48,0010,1229	:2344	Q Q.AND.R[9],CLK.UBCC		: CHECK FOR A HIT IN GROUP 1
U 1229.	0000,013C,0180,0800,0000,109A	:2345	Z?		: BRANCH IF NO HIT
U 109A.	0000,003C,0180,0800,0000,109D	:2346	=0 J/HITG1		
U 109B.	0000,003C,0180,0800,0000,109C	:2347	NOP		
U 109C.	0000,003D,0180,0800,0000,1165	:2348	=0 ERROR2		: DUAL ADDRESSING PROBLEM
U 109D.	0010,0038,0180,0968,0010,122A	:2349	HITG1: ALU_R[OD],CLK.UBCC		: DONE CHECKING?
U 122A.	0000,013C,0180,0800,0000,109E	:2350	Z?		: BRANCH IF YES
U 109E.	0010,0038,01C0,0968,0000,121F	:2351	=0 Q RC[OD],J/LOOPD		: CHECK THE NEXT ADDRESS
U 109F.	0810,0038,0180,0970,0000,122B	:2352	D RC[OE]		: GET ADR WRITTEN AS ONE'S
U 122B.	0811,0034,01C0,0900,0000,122C	:2353	D D[AND]RC[0],Q_ALU		: GET THE TAG PART ONLY
U 122C.	0001,003C,0180,0A80,0000,122D	:2354	R[0] D		: SET NEW ADDRESS TO WRITE AS ZERO'S
U 122D.	081D,0014,0180,0800,0000,122E	:2355	D D+Q		: SHIFT THE TAG BIT LEFT
U 122E.	0010,0038,01C0,0970,0000,122F	:2356	Q RC[OE]		: NOW INSERT THE NEW TAG
U 122F.	0011,2024,01C0,0900,0000,1230	:2357	Q Q.ANDNOT.RC[0]		: INTO THE ALL ONE'S PATTERN
U 1230.	001D,0030,0180,09F0,0000,1231	:2358	RC[OE] D.OR.Q		
U 1231.	0011,0034,0180,0900,0010,1232	:2359	ALU_D[AND]RC[0],CLK.UBCC		: DONE WITH TEST?
U 1232.	0000,013C,0180,0800,0000,10A0	:2360	Z?		
U 10A0.	0000,003C,0180,0800,0000,1095	:2361	=0 J/LOOPC		: CONTINUE WITH NEXT ADDRESS
U 10A1.	0000,003C,0180,0800,0000,10A2	:2362	NOP		


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:2363 .PAGE "TEST E0 DUAL ADDRESSING TEST OF CACHE VALID BIT"
:2364 *****
:2365 ++
:2366
:2367 TEST E0 DUAL ADDRESSING TEST OF CACHE VALID BIT
:2368
:2369 TEST DESCRIPTION
:2370
:2371 THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES ON THE
:2372 CACHE VALID BIT MEMORY. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
:2373
:2374 1) INVALIDATE LOC 0 3) INVALIDATE LOC 10
:2375 VALIDATE LOC 8 VALIDATE LOC 20
:2376 CHECK LOC 0 FOR INVALID CHECK LOC 10 FOR INVALID
:2377 CHECK LOC 8 FOR INVALID CHECK LOC 0 FOR INVALID
:2378 2) INVALIDATE LOC 8 4) ETC...
:2379 VALIDATE LOC 10
:2380 CHECK LOC 8 FOR INVALID
:2381 CHECK LOC 0 FOR INVALID
:2382
:2383 SUBTEST 1 - CHECK THE GROUP 0 VALID MEMORY
:2384
:2385 SUBTEST 2 - CHECK THE GROUP 1 VALID MEMORY
:2386
:2387 LOGIC DESCRIPTION
:2388
:2389 THIS TEST CHECKS THE ADDRESS LINES ON THE VALID BIT MEMORY OF THE
:2390 CACHE ON THE CAM MODULE.
:2391
:2392 ERROR DESCRIPTION
:2393
:2394 DATA: ADDRESS THAT IS MARKED VALID
:2395 ADDRESS THAT IS BEING CHECKED FOR INVALID
:2396 ID[PARITY]
:2397 --
:2398 *****
:2399
:2400 =0
:2401 T002: NEWTST
:2402 RC[OE]_K[.3]
:2403 CALL J7REGISTERSETUP ; SETUP SOME REGISTERS
:2404 D R[3] ; GET MAINT REG DATA
:2405 ID[MAINT]_D
:2406 //////////////////////////////////////
:2407 +
:2408 CHECK THE VALID BIT MEMORY IN GROUP 0
:2409 -
:2410 =0
:2411 SUBTEST
:2412 RC[OE]_K[.8] ; INIT THE ADDRESS TO MARK VALID
:2413 R[0]_0 ; INIT THE ADDRESS TO MARK INVALID
:2414 D K[FF],CALL[DCF] ; GENERATE MASK FOR TAG BITS
:2415 RC[0]_D
:2416 ERLOOP
:2417 LOOPE: VA_ALU,ALU_R[0] ; LOAD ADDRESS TO MARK INVALID
:2418 CACHE_INVALIDATE ; MAKE IT INVALID
:2419 VA_ALU,ALU_RC[OE] ; LOAD ADDRESS TO MARK VALID

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U 10A2, 0000,003D,0180,0800,0000,114E
U 10A3, 0018,0038,0D80,09F8,0000,10A4
U 10A4, 0000,003D,0180,0800,0000,11DA
U 10A5, 0800,003C,0180,0A18,0000,1233
U 1233, 0000,003C,7580,3C00,0000,10A6

U 10A6, 0000,003D,0180,0800,0000,1167
U 10A7, 0018,0038,0180,09F0,0000,1234
U 1234, 0003,003C,0180,0A80,0000,10A8
U 10A8, 0818,0039,4980,0800,0000,1185
U 10A9, 0001,003C,0180,0980,0000,10AA
U 10AA, 0000,003D,0180,0800,0000,1162
U 10AB, 0000,003C,0180,0A00,0200,1235
U 1235, 0000,003C,0180,9000,0000,1236
U 1236, 0010,0038,0180,0970,0200,1237


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U 1237, 0000,003C,0180,9800,0000,1238 :2418      MCT/VALIDATE      : MAKE IT VALID
U 1238, 0010,0038,01C0,0970,0000,1239 :2419      Q_RC[OE]      : GENERATE ADDRESS TO CHECK FOR
U 1239, 0000,003C,0180,0800,0000,123A :2420      Q_Q.RIGHT      : INVALID
U 123A, 0019,2024,5DC0,09E8,0200,123B :2421      Q_Q.ANDNOT.K[.7],VA_ALU,RC[OD]_ALU : LOAD THE ADDRESS
U 123B, 0000,003C,0180,0800,0084,723C :2422      SC_K[.8]      : SET BIT FOR PARITY TRAP CATCHER
U 123C, 0003,001C,0180,0AF8,0000,123D :2423      R[OF] NOT.MASK      :
U 123D, 0000,003C,0180,C800,0000,123E :2424      D[LONG] CACHE.P      : REFERENCE THE ADDRESS
U 123E, 0000,003C,79F0,2C00,0000,123F :2425      Q_ID[PARITY]      : SEE IF CACHE PARITY TRAP OCCURRED
U 123F, 0001,203C,0180,09E0,0000,1240 :2426      RC[OC] Q      :
U 1240, 0000,003C,0180,0A78,0010,1241 :2427      ALU_R[OF],CLK.UBCC :
U 1241, 0000,013C,0180,0800,0000,10AC :2428      Z?      :
U 10AC, 0000,003C,0180,0800,0000,10AF :2429      =0      J/LOOPF1      : NO CACHE PARITY TRAP
U 10AD, 0000,003C,0180,0800,0000,10AE :2430      NOP      :
U 10AE, 0000,003D,0180,0800,0000,1165 :2431      =0      ERROR2      : CACHE PARITY TRAP OCCURRED
U 10AF, 0000,003C,75F0,2C00,0000,1242 :2432      LOOPF1: Q_ID[MAINT] : READ THE HIT/MISS BITS
U 1242, 001C,0034,01C0,0A38,0010,1243 :2433      Q_Q.AND.R[7],CLK.UBCC : MASK AND CHECK FOR A MISS
U 1243, 0000,013C,0180,0800,0000,10B0 :2434      Z?      :
U 10B0, 0000,003D,0180,0800,0000,1165 :2435      =0      ERROR2      : SHOULD HAVE BEEN A MISS
U 10B1, 0010,0038,01C0,0968,0010,1244 :2436      Q_RC[OD],CLK.UBCC : MORE ADDRESS TO CHECK?
U 1244, 0000,013C,0180,0800,0000,10B2 :2437      Z?      :
U 10B2, 0000,003C,0180,0800,0000,1239 :2438      =0      J/LOOPF      : YES, CONTINUE
U 10B3, 0810,0038,0180,0970,0000,1245 :2439      D_RC[OE]      : GET ADDRESS THAT IS A HIT
U 1245, 0501,003C,0180,0A80,0000,1246 :2440      R[O] D,D D.LEFT      : SET NEW ADDRESS TO MAKE A MISS
U 1246, 0811,0034,0180,0900,0010,1247 :2441      D_D[AND]R[O],CLK.UBCC : DONE YET?
U 1247, 0000,013C,0180,0800,0000,10B4 :2442      Z?      :
U 10B4, 0001,003C,0180,09F0,0000,10AB :2443      =0      RC[OE]_D,J/LOOPE : CONTINUE
U 10B5, 0000,003C,0180,0800,0000,10B6 :2444      NOP      :
:2445      :////////////////////
:2446      :+
:2447      : CHECK THE VALID BIT MEMORY IN GROUP 1
:2448      :-
U 10B6, 0000,003D,0180,0800,0000,1167 :2449      =0      SUBTEST      :
U 10B7, 0800,003C,8580,0A10,0084,7248 :2450      D_R[2],SC_K[C]      : GENERATE MAINT REG DATA
U 1248, 0801,001C,0180,0800,0000,1249 :2451      D-D.ORNOT.MASK      :
U 1249, 0000,003C,7580,3C00,0000,124A :2452      ID[MAINT] D      :
U 124A, 0018,0038,0180,09F0,0000,124B :2453      RC[OE]_K[.8]      : INIT THE ADDRESS TO MARK VALID
U 124B, 0003,003C,0180,0A80,0000,10B8 :2454      R[O] 0      : INIT THE ADDRESS TO MARK INVALID
U 10B8, 0818,0039,4980,0800,0000,1185 :2455      =0      D_K[FF],CALLED[DCF] : GENERATE MASK FOR TAG BITS
U 10B9, 0001,003C,0180,0980,0000,10BA :2456      RC[O] D      :
U 10BA, 0000,003D,0180,0800,0000,1162 :2457      =0      ERLOOP      :
U 10BB, 0000,003C,0180,0A00,0200,124C :2458      LOOPG: VA_ALU,ALU R[O] : LOAD ADDRESS TO MARK INVALID
U 124C, 0000,003C,0180,9000,0000,124D :2459      CACHE.INVALIDATE : MAKE IT INVALID
U 124D, 0010,0038,0180,0970,0200,124E :2460      VA_ALU,ALU RC[OE] : LOAD ADDRESS TO MARK VALID
U 124E, 0000,003C,0180,9800,0000,124F :2461      MCT/VALIDATE      : MAKE IT VALID
U 124F, 0010,0038,01C0,0970,0000,1250 :2462      Q_RC[OE]      : GENERATE ADDRESS TO CHECK FOR
U 1250, 0000,003C,0180,0800,0000,1251 :2463      LOOPH: Q_Q.RIGHT      : INVALID
U 1251, 0019,2024,5DC0,09E8,0200,1252 :2464      Q_Q.ANDNOT.K[.7],VA_ALU,RC[OD]_ALU : LOAD THE ADDRESS
U 1252, 0000,003C,0180,0800,0084,7253 :2465      SC_K[.8]      : SET BIT FOR PARITY TRAP CATCHER
U 1253, 0003,001C,0180,0AF8,0000,1254 :2466      R[OF] NOT.MASK      :
U 1254, 0000,003C,0180,C800,0000,1255 :2467      D[LONG] CACHE.P      : REFERENCE THE ADDRESS
U 1255, 0000,003C,79F0,2C00,0000,1256 :2468      Q_ID[PARITY]      :
U 1256, 0001,203C,0180,09E0,0000,1257 :2469      RC[OC] Q      : SEE IF CACHE PARITY TRAP OCCURRED
U 1257, 0000,003C,0180,0A78,0010,1258 :2470      ALU_R[OF],CLK.UBCC :
U 1258, 0000,013C,0180,0800,0000,10BC :2471      Z?      :
U 10BC, 0000,003C,0180,0800,0000,10BF :2472      =0      J/LOOPH1      : NO CACHE PARITY TRAP

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U 10BD,	0000,003C,0180,0800,0000,10BE	:2473	NOP		
U 10BE,	0000,003D,0180,0800,0000,1165	:2474	=0 ERROR2		: CACHE PARITY TRAP OCCURRED
U 10BF,	0000,003C,75F0,2C00,0000,1259	:2475	LOOPH1: Q_ID[MAINT]		: READ THE HIT/MISS BITS
U 1259,	001C,0034,01C0,0A38,0010,125A	:2476	Q-Q.AND.R[7],CLK.UBCC		: MASK AND CHECK FOR A MISS
U 125A,	0000,013C,0180,0800,0000,10C0	:2477	Z?		
U 10C0,	0000,003D,0180,0800,0000,1165	:2478	=0 ERROR2		: SHOULD HAVE BEEN A MISS
U 10C1,	0010,0038,01C0,0968,0010,125B	:2479	Q_RC[0D],CLK.UBCC		: MORE ADDRESS TO CHECK?
U 125B,	0000,013C,0180,0800,0000,10C2	:2480	Z?		
U 10C2,	0000,003C,0180,0800,0000,1250	:2481	=0 J/LOOPH		: YES, CONTINUE
U 10C3,	0810,0038,0180,0970,0000,125C	:2482	D_RC[0E]		: GET ADDRESS THAT IS A HIT
U 125C,	0501,003C,0180,0A80,0000,125D	:2483	R[0] D,D D.LEFT		: SET NEW ADDRESS TO MAKE A MISS
U 125D,	0811,0034,0180,0900,0010,125E	:2484	D D[AND]RC[0],CLK.UBCC		: DONE YET?
U 125E,	0000,013C,0180,0800,0000,10C4	:2485	Z?		
U 10C4,	0001,003C,0180,09F0,0000,10BB	:2486	=0 RC[0E]_D,J/LOOPG		: CONTINUE
U 10C5,	0000,003C,0180,0800,0000,10C6	:2487	NOP		

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:2488      .PAGE      "TEST E1      DUAL ADDRESSING TEST OF CACHE DATA MATRIX"
:2489      *****
:2490      ++
:2491      TEST E1      DUAL ADDRESSING TEST OF CACHE DATA MATRIX
:2492
:2493      TEST DESCRIPTION
:2494
:2495      THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES ON THE
:2496      CACHE DATA MATRIX. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
:2497
:2498      1) WRITE 0 TO ADDRESS 0      3) WRITE 0 TO ADDRESS 8
:2499      WRITE 1 TO ADDRESS 4      WRITE 1 TO ADDRESS 10
:2500      CHECK ADDRESS 0 FOR 0      CHECK ADDRESS 8 FOR 0
:2501      CHECK ADDRESS 4 FOR 0      CHECK ADDRESS 4 FOR 0
:2502      CHECK ADDRESS 0 FOR 0
:2503      2) WRITE 0 TO ADDRESS 4      CHECK ADDRESS 0 FOR 0
:2504      WRITE 1 TO ADDRESS 8
:2505      CHECK ADDRESS 4 FOR 0      4) ETC...
:2506      CHECK ADDRESS 0 FOR 0
:2507
:2508      SUBTEST 1 - CHECK GROUP 0
:2509
:2510      SUBTEST 2 - CHECK GROUP 1
:2511
:2512      LOGIC DESCRIPTION
:2513
:2514      THIS TEST CHECKS THE ADDRESS LINES TO THE CACHE DATA MATRIX ON
:2515      THE CDM MODULE.
:2516
:2517      ERROR DESCRIPTION
:2518
:2519      DATA: ADDRESS WRITTEN AS ONE'S
:2520      ADDRESS BEING CHECKED FOR ZER'S
:2521      EXPECTED DATA
:2522      RECEIVED DATA
:2523      ID[PARITY]
:2524      --
:2525      *****
:2526      =0
:2527      T003:  NEWTST
:2528      ALU 0+K[.4]+1,RC[0F]_ALU
:2529      =0    CAL[ J/REGISTERSETUP      : SETUP SOME REGISTERS
:2530      D R[3]      : GET MAINT REG DATA
:2531      ID[MAINT] D
:2532      ://///////////////
:2533      +
:2534      : CHECK GROUP 0
:2535      :-
:2536      =0    SUBTEST
:2537      RC[0E]_K[.4]      : INIT ADDRESS TO WRITE ZERO'S
:2538      RC[0D]_0      : INIT ADDRESS TO WRITE ONE'S
:2539      =0    D K[.FF],CALL[DCF]      : GENERATE MASK FOR TAG BITS
:2540      RC[0] D
:2541      RC[0C]_0      : SET THE EXPECTED DATA
:2542      =0    ERLOOP

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U 10C6, 0000,003D,0180,0800,0000,114E
U 10C7, 001B,0010,1180,09F8,0000,10C8
U 10C8, 0000,003D,0180,0800,0000,11DA
U 10C9, 0800,003C,0180,0A18,0000,125F
U 125F, 0000,003C,7580,3C00,0000,10CA

U 10CA, 0000,003D,0180,0800,0000,1167
U 10CB, 001B,0038,1180,09F0,0000,1260
U 1260, 0003,003C,0180,09E8,0000,10CC
U 10CC, 0818,0039,4980,0800,0000,1185
U 10CD, 0001,003C,0180,0980,0000,1261
U 1261, 0003,003C,0180,09E0,0000,10CE
U 10CE, 0000,003D,0180,0800,0000,1162


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U 10CF, 0F10,0038,0180,0968,0200,1262 :2543 LOOPI: VA ALU,ALU_RC[OD],D_0      ; SET ADDRESS TO WRITE ZERO'S
U 1262, 0000,003C,0180,9800,0000,1263 :2544 MCT/VALIDATE      ; WRITE THE ZERO'S
U 1263, 0010,0038,0180,0970,0200,1264 :2545 VA ALU,ALU_RC[OE]    ; SET ADDRESS TO WRITE ONE'S
U 1264, 081B,0000,0580,0800,0000,1265 :2546 D_0-K[.1]          ; GENERATE DATA TO WRITE
U 1265, 0000,003C,0180,9800,0000,1266 :2547 MCT/VALIDATE      ; WRITE THE ONE'S
U 1266, 0010,0038,01C0,0970,0000,1267 :2548 Q_RC[OE]          ; GENERATE ADDRESS TO CHECK FOR ZERO'S
U 1267, 0000,003C,0180,0800,0084,7268 :2549 LOOPJ: SC K[.8]    ; SET BIT FOR PARITY TRAP CATCHER
U 1268, 0003,001C,0180,0AF8,0000,1269 :2550 R[OF] NOT.MASK      ; ...
U 1269, 0000,003C,0180,0800,0000,126A :2551 Q_Q.RIGHT          ; ...
U 126A, 0019,2024,0DC0,0800,0200,126B :2552 Q-Q.ANDNOT.K[.3],VA ALU ; LOAD THE ADDRESS
U 126B, 0001,203C,0180,C9E8,0000,126C :2553 D[LONG] CACHE.P,RC[OD],Q ; READ THE ADDRESS
U 126C, 0000,003C,79F0,2C00,0000,126D :2554 Q_ID[PARITY]
U 126D, 0001,203C,0180,09D0,0000,126E :2555 RC[OA] Q          ; SEE IF CACHE PARITY TRAP OCCURRED
U 126E, 0000,003C,0180,0A78,0010,126F :2556 ALU_RC[OF],CLK.UBCC ; ...
U 126F, 0000,013C,0180,0800,0000,10D0 :2557 Z?              ; ...
U 10D0, 0000,003C,0180,0800,0000,10D3 :2558 =0 J/LOOPJ1        ; NO CACHE PARITY TRAP OCCURRED
U 10D1, 0000,003C,0180,0800,0000,10D2 :2559 NOP
U 10D2, 0000,003D,0180,0800,0000,1165 :2560 =0 ERROR2          ; A CACHE PARITY TRAP OCCURRED
U 10D3, 0001,003C,0180,0800,0010,1270 :2561 LOOPJ1: ALU_D,CLK.UBCC ; CHECK THAT DATA WAS ZERO
U 1270, 0000,013C,0180,0800,0000,10D4 :2562 Z?
U 10D4, 0001,003D,0180,09D8,0000,1165 :2563 =0 ERROR2,RC[OB] D ; RECEIVED DATA INCORRECT
U 10D5, 0010,0038,01C0,0968,0010,1271 :2564 Q_RC[OD],CLK.UBCC ; DONE CHECKING ADDRESSES?
U 1271, 0000,013C,0180,0800,0000,10D6 :2565 Z?
U 10D6, 0000,003C,0180,0800,0000,1267 :2566 =0 J/LOOPJ          ; NO, CONTINUE
U 10D7, 0810,0038,0180,0970,0000,1272 :2567 D_RC[OE]          ; GET ADDRESS TO WRITE ONE'S
U 1272, 0501,003C,0180,09E8,0000,1273 :2568 RC[OD] D,D D.LEFT ; SET NEW ADDRESS TO WRITE ZER'S
U 1273, 0811,0034,0180,0900,0010,1274 :2569 D D[AND]RC[O],CLK.UBCC ; DONE WITH TEST?
U 1274, 0000,013C,0180,0800,0000,10D8 :2570 Z?
U 10D8, 0001,003C,0180,09F0,0000,10CF :2571 =0 RC[OE]_D,J/LOOPI
U 10D9, 0000,003C,0180,0800,0000,10DA :2572 NOP
:2573 :////////////////////
:2574 :+
:2575 : CHECK GROUP 1
:2576 :-
:2577 =0 SUBTEST
U 10DA, 0000,003D,0180,0800,0000,1167 :2578 D_R[2],SC_K[C]      ; GET MAINT REG DATA
U 10DB, 0800,003C,8580,0A10,0084,7275 :2579 D-D.ORNOT.MASK      ; FORCE REPLACE G1
U 1275, 0801,001C,0180,0800,0000,1276 :2580 ID[MAINT] D
U 1276, 0000,003C,7580,3C00,0000,1277 :2581 RC[OE]_K[.4]
U 1277, 0018,0038,1180,09F0,0000,1278 :2582 RC[OD]_0
U 1278, 0003,003C,0180,09E8,0000,10DC :2583 =0 ERLOOP
U 10DC, 0000,003D,0180,0800,0000,1162 :2584 LOOPK: VA ALU,ALU_RC[OD],D_0 ; SET ADDRESS TO WRITE ZERO'S
U 10DD, 0F10,0038,0180,0968,0200,1279 :2585 MCT/VALIDATE      ; WRITE THE ZERO'S
U 1279, 0000,003C,0180,9800,0000,127A :2586 VA ALU,ALU_RC[OE]    ; SET ADDRESS TO WRITE ONE'S
U 127A, 0010,0038,0180,0970,0200,127B :2587 D_0-K[.1]          ; GENERATE DATA TO WRITE
U 127B, 081B,0000,0580,0800,0000,127C :2588 MCT/VALIDATE      ; WRITE THE ONE'S
U 127C, 0000,003C,0180,9800,0000,127D :2589 Q_RC[OE]          ; GENERATE ADDRESS TO CHECK FOR ZERO'S
U 127D, 0010,0038,01C0,0970,0000,127E :2590 LOOPL: SC K[.8]    ; SET BIT FOR PARITY TRAP CATCHER
U 127E, 0000,003C,0180,0800,0084,727F :2591 R[OF] NOT.MASK      ; IN R[OF]
U 127F, 0003,001C,0180,0AF8,0000,1280 :2592 Q_Q.RIGHT          ; ...
U 1280, 0000,003C,0180,0800,0000,1281 :2593 Q-Q.ANDNOT.K[.3],VA ALU ; LOAD THE ADDRESS
U 1281, 0019,2024,0DC0,0800,0200,1282 :2594 D[LONG] CACHE.P,RC[OD],Q ; READ THE ADDRESS
U 1282, 0001,203C,0180,C9E8,0000,1283 :2595 Q_ID[PARITY]
U 1283, 0000,003C,79F0,2C00,0000,1284 :2596 RC[OA] Q          ; SEE IF CACHE PARITY TRAP OCCURRED
U 1284, 0001,203C,0180,09D0,0000,1285 :2597 ALU_RC[OF],CLK.UBCC ; ...
U 1285, 0000,003C,0180,0A78,0010,1286 :2597

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U 1286, 0000,013C,0180,0800,0000,10DE :2598
U 10DE, 0000,003C,0180,0800,0000,10E1 :2599 =0 J/LOOP1
U 10DF, 0000,003C,0180,0800,0000,10E0 :2600 NOP
U 10E0, 0000,003D,0180,0800,0000,1165 :2601 =0 ERROR2
U 10E1, 0001,003C,0180,0800,0010,1287 :2602 LOOP1: ALU_D,CLK.UBCC
U 1287, 0000,013C,0180,0800,0000,10E2 :2603 Z?
U 10E2, 0001,003D,0180,09D8,0000,1165 :2604 =0 ERROR2,RC[0B] D
U 10E3, 0010,0038,01C0,0968,0010,1288 :2605 Q RC[0D],CLK.0BCC
U 1288, 0000,013C,0180,0800,0000,10E4 :2606 Z?
U 10E4, 0000,003C,0180,0800,0000,127E :2607 =0 J/LOOP1
U 10E5, 0810,0038,0180,0970,0000,1289 :2608 D RC[0E]
U 1289, 0501,003C,0180,09E8,0000,128A :2609 RC[0D] D,D D.LEFT
U 128A, 0811,0034,0180,0900,0010,128B :2610 D D[AND]RC[0],CLK.UBCC
U 128B, 0000,013C,0180,0800,0000,10E6 :2611 Z?
U 10E6, 0001,003C,0180,09F0,0000,10DD :2612 =0 RC[0E]_D,J/LOOPK
U 10E7, 0000,003C,0180,0800,0000,10E8 :2613 NOP
    
```

```

: : NO CACHE PARITY TRAP OCCURRED
: : A CACHE PARITY TRAP OCCURRED
: : CHECK THAT DATA WAS ZERO
: : RECEIVED DATA INCORRECT
: : DONE CHECKING ADDRESSES?
: : NO, CONTINUE
: : GET ADDRESS TO WRITE ONE'S
: : SET NEW ADDRESS TO WRITE ZER'S
: : DONE WITH TEST?
    
```

```

:2614 .PAGE "TEST E2 CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION"
:2615 *****
:2616 ++
:2617
:2618 TEST E2 CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION
:2619
:2620 TEST DESCRIPTION
:2621
:2622 THIS TEST CHECKS THAT THE MCT FUNCTIONS ENABLE/DISABLE THE
:2623 CACHE PARITY MICRO TRAP. THIS IS DONE BY FORCING A PARITY ERROR
:2624 IN THE ADDRESS MATRIX WHILE EXECUTING THE MCT FUNCTION. THE MICRO
:2625 TRAP FLAG (R[OF]) IS CHECKED TO DETERMINE IF THE TRAP OCCURRED.
:2626
:2627 SUBTEST 1 - CHECK THOSE FUNCTIONS THAT SHOULD MICRO TRAP.
:2628
:2629 SUBTEST 2 - CHECK THOSE FUNCTIONS THAT SHOULD NOT MICRO TRAP.
:2630
:2631 LOGIC DESCRIPTION
:2632
:2633 THIS TEST CHECKS THE CONTENTS OF THE MCT FIELD DECODE ROMS ON
:2634 THE SBL MODULE FOR THE 'U CP READ' SIGNAL.
:2635
:2636 ERROR DESCRIPTION
:2637
:2638 DATA: EXPECTED MICRO TRAP FLAG
:2639 RECEIVED MICRO TRAP FLAG
:2640 FUNCTION INDEX (INDICATES WHICH FUNCTION WAS BEING EXECUTED)
:2641
:2642 TO DETERMINE THE FUNCTION BEING EXECUTED, LOOK IN THE APPROPRIATE
:2643 FUNCTION TABLE AT THE END OF THE TEST, USING THE FUNCTION INDEX
:2644 TO INDEX THRU THE TABLE.
:2645 --
:2646 *****
:2647 =0
:2648
U 10E8, 0000,003D,0180,0800,0000,114E :2648
U 10E9, 0018,0038,0D80,09F8,0000,128C :2649
U 128C, 0818,0038,8980,0800,0000,128D :2650
U 128D, 0000,003C,85F8,0800,0084,728E :2651
U 128E, 0D00,003C,0180,0800,0000,128F :2652
U 128F, 0000,003C,7580,3C00,0000,1290 :2653
U 1290, 0818,0038,0580,0800,0000,1291 :2654
U 1291, 0D00,003C,1180,0800,0084,9292 :2655
U 1292, 0819,003C,4180,0800,0000,1293 :2656
U 1293, 0001,003C,0180,0A80,0000,1294 :2657
U 1294, 0818,0038,0180,0800,0000,1295 :2658
U 1295, 0D00,003C,0180,0800,0000,1296 :2659
U 1296, 0001,003C,0180,0A88,0000,1297 :2660
U 1297, 0F00,003C,0180,0A00,0200,1298 :2661
U 1298, 0000,003C,0180,9800,0000,10EA :2662
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:2664 ++
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U 10EC, 0000,003D,0180,0800,0000,1162 :2669 =0 ERLOOP
:2670 MCTLOOP:
U 10ED, 0000,003C,0180,0800,0084,729A :2671 SC K[.8]
U 129A, 0003,001C,0180,0AF8,0000,129B :2672 R[0F] NOT.MASK ; SET THE TRAP FLAG
U 129B, 0000,003C,0180,0A00,0200,129C :2673 VA ALD,ALU R[0] ; LOAD THE VA
U 129C, 0800,003C,75F0,2E08,0000,129D :2674 D-R[1],Q-ID[MAINT] ; SET THE PARITY REVERSE BIT
U 129D, 081D,0030,0180,0800,0000,129E :2675 D-D.OR.Q
U 129E, 0810,0038,7580,3D60,0000,10EE :2676 ID[MAINT] D,D R[0C] ; GET THE FUNCTION INDEX
U 10EE, 0000,193D,0180,0800,0000,1030 :2677 D3-0?,CALC,J/EXPTRAP ; GO EXECUTE THE FUNCTION
U 10EF, 0800,003C,0180,0A78,0010,129F :2678 D-R[0F],CLK.UBCC ; CHECK THAT THE TRAP OCCURRED
U 129F, 0000,013C,0180,0800,0000,10F0 :2679 Z?
U 10F0, 0001,003D,0180,09E8,0000,1165 :2680 =0 ERROR2,R[0D],D ; NO MICRO TRAP
U 10F1, 0810,0038,0180,0960,0000,12A0 :2681 D-R[0C] ; GET FUNCTION INDEX
U 12A0, 0019,0000,0580,09E0,0010,12A1 :2682 R[0C],D-K[.1],CLK.UBCC ; DONE YET?
U 12A1, 0000,1B3C,0180,0800,0000,1007 :2683 ALU.N?
U 1007, 0000,003C,0180,0800,0000,10ED :2684 =0111 J/MCTLOOP ; NO, CONTINUE
U 100F, 0000,003C,0180,0800,0000,10F2 :2685 NOP
:2686 :////////////////////
:2687 :+
:2688 : CHECK THOSE FUNCTIONS THAT SHOULD NOT MICRO TRAP
:2689 :-
U 10F2, 0000,003D,0180,0800,0000,1167 :2690 =0 SUBTEST
U 10F3, 0018,0038,6180,09E0,0000,12A2 :2691 R[0C] K[.F] ; SET THE FUNCTION INDEX
U 12A2, 0000,003C,0180,0800,0084,72A3 :2692 SC K[.8]
U 12A3, 0003,001C,0180,09F0,0000,10F4 :2693 R[0E] NOT.MASK ; SET THE EXPECTED TRAP FLAG
U 10F4, 0000,003D,0180,0800,0000,1162 :2694 =0 ERLOOP
:2695 MCTLOOPB:
U 10F5, 0000,003C,0180,0800,0084,72A4 :2696 SC K[.8]
U 12A4, 0003,001C,0180,0AF8,0000,12A5 :2697 R[0F] NOT.MASK ; SET THE TRAP FLAG
U 12A5, 0000,003C,0180,0A00,0200,12A6 :2698 VA ALD,ALU R[0] ; LOAD THE ADDRESS
U 12A6, 0800,003C,75F0,2E08,0000,12A7 :2699 D-R[1],Q-ID[MAINT] ; LOAD THE MAINT REG TO FORCE
U 12A7, 081D,0030,0180,0800,0000,12A8 :2700 D-D.OR.Q
U 12A8, 0810,0038,7580,3D60,0000,10F6 :2701 ID[MAINT] D,D R[0C] ; THE PARITY ERROR
U 10F6, 0000,193D,0180,0800,0000,1020 :2702 =0 D3-0?,CALC,J/NOTRAP ; GO EXECUTE THE FUNCTION
U 10F7, 0800,003C,0180,0A78,0010,12A9 :2703 D-R[0F],CLK.UBCC ; DID A TRAP OCCUR?
U 12A9, 0000,013C,0180,0800,0000,10F8 :2704 Z?
U 10F8, 0000,003C,0180,0800,0000,10FB :2705 =0 J/MCTOK ; NO, OK
U 10F9, 0000,003C,0180,0800,0000,10FA :2706 NOP
U 10FA, 0001,003D,0180,09E8,0000,1165 :2707 =0 ERROR2,R[0D],D ; MICRO TRAP OCCURRED
U 10FB, 0810,0038,0180,0960,0000,12AB :2708 MCTOK: D-R[0C] ; GET THE FUNCTION INDEX
U 12AB, 0019,0000,0580,09E0,0010,12AC :2709 R[0C],D-K[.1],CLK.UBCC ; DONE YET?
U 12AC, 0000,1B3C,0180,0800,0000,1017 :2710 ALU.N?
U 1017, 0000,003C,0180,0800,0000,10F5 :2711 =0111 J/MCTLOOPB ; NO, CONTINUE
U 101F, 0000,003C,0180,0800,0000,12AD :2712 J/ENDTOOA ; DONE WITH TEST
:2713 :+
:2714 : THE FOLLOWING TABLE ARE THE FUNCTIONS THAT SHOULD MICRO TRAP.
:2715 :-
:2716 =000
:2717 EXPTRAP:
U 1030, 0000,003E,0180,4000,0000,0001 :2718 MCT/READ.V.RCHK,RETURN1
U 1031, 0000,003E,0180,4800,0000,0001 :2719 MCT/READ.V.NOCHK,RETURN1
U 1032, 0000,003E,0180,5000,0000,0001 :2720 MCT/READ.V.WCHK,RETURN1
U 1033, 0000,003E,0180,5800,0000,0001 :2721 MCT/READ.V.IBCHK,RETURN1
U 1034, 0000,003E,0180,6800,0000,0001 :2722 MCT/LOCKREAD.V.NOCHK,RETURN1
U 1035, 0000,003E,0180,7000,0000,0001 :2723 MCT/LOCKREAD.V.WCHK,RETURN1

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U 1036, 0000,003E,0180,C800,0000,0001 :2724
 U 1037, 0000,003E,0180,E800,0000,0001 :2725
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 U 1020, 0000,003E,0180,0000,0000,0001 :2731
 U 1021, 0000,003E,0180,1000,0000,0001 :2732
 U 1022, 0000,003E,0180,2800,0000,0001 :2733
 U 1023, 0000,003E,0180,3000,0000,0001 :2734
 U 1024, 0000,003E,0180,3800,0000,0001 :2735
 U 1025, 0000,003E,0180,6000,0000,0001 :2736
 U 1026, 0000,003E,0180,8000,0000,0001 :2737
 U 1027, 0000,003E,0180,8800,0000,0001 :2738
 U 1028, 0000,003E,0180,9000,0000,0001 :2739
 U 1029, 0000,003E,0180,9800,0000,0001 :2740
 U 102A, 0000,003E,0180,A000,0000,0001 :2741
 U 102B, 0000,003E,0180,A800,0000,0001 :2742
 U 102C, 0000,003E,0180,B800,0000,0001 :2743
 U 102D, 0000,003E,0180,D800,0000,0001 :2744
 U 102E, 0000,003E,0180,F800,0000,0001 :2745
 U 102F, 0000,003E,0180,0800,0000,0001 :2746
 U 12AD, 0000,003C,8580,0A00,0284,72AE :2747
 U 12AE, 0803,001C,0180,0800,0000,12AF :2748
 U 12AF, 0F00,003C,7580,3C00,0000,12B0 :2749
 U 12B0, 0000,003C,0180,9800,0000,10FC :2750

MCT/READ.P,RETURN1
 MCT/LOCKREAD.P,RETURN1
 :+
 : THE FOLLOWING TABLE ARE THOSE FUNCTIONS THAT SHOULD NOT TRAP.
 :-
 =0000
 NOTRAP:
 MCT/TEST.RCHK,RETURN1
 MCT/TEST.WCHK,RETURN1
 MCT/WRITE.V.NOCHK,RETURN1
 MCT/WRITE.V.WCHK,RETURN1
 MCT/LOCKWRITE.V.XCHK,RETURN1
 MCT/READ.V.NEWPC,RETURN1
 MCT/SBI.HOLD,RETURN1
 MCT/SBI.HOLD+UNJAM,RETURN1
 MCT/INVALIDATE,RETURN1
 MCT/VALIDATE,RETURN1
 MCT/EXTWRITE.P,RETURN1
 MCT/WRITE.P,RETURN1
 MCT/LOCKWRITE.P,RETURN1
 MCT/READ.INT.SUM,RETURN1
 MCT/ALLOW.IB.READ,RETURN1
 MCT/MEM.NOP,RETURN1
 ENDT00A: SC K[C],VA_ALU,ALU_R[0] : CLEAR THE PARITY ERROR
 D NOT.MASK
 ID[MAINT] D,D_0
 MCT/VALIDATE


```

:2751 .PAGE "TEST E3 MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY"
:2752 *****
:2753 **
:2754 TEST E3 MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY
:2755
:2756 TEST DESCRIPTION
:2757 THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP
:2758 0'S DATA MEMORY.
:2759
:2760 LOGIC DESCRIPTION
:2761 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2762 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2763 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2764 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2765 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2766 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2767 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2768 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2769 REGISTER ON THE SBI CONTROL MODULE.
:2770
:2771 ERROR DESCRIPTION
:2772 VA REFERENCED
:2773 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2774 ONLY THE HIT AND MISS BITS ARE RELEVANT)
:2775 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2776 UTRAP OCCURS
:2777 GOT CACHE MAINT REGISTER
:2778 EXPECTED READ DATA
:2779 GOT READ DATA
:2780 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2781 FLAG UTRAP TYPE
:2782 ----
:2783 1DE NO UTRAP OCCURRED
:2784 DE CACHE PARITY UTRAP
:2785 15E TB PARITY ERROR
:2786 19E TB MISS
:2787 1CE TB PROTECTION ERROR
:2788 1D6 TB MODIFY BIT ERROR
:2789 1DA X PAGE UTRAP
:2790 1DC UNALIGNED DATA UTRAP
:2791
:2792 --
:2793 *****
:2794 =0
:2795 MIDGO: NEWTST
:2796 D 0
:2797 =0 ID[TBERO] D,CALL,J/SOFF ; TBAND SBI CYCLES OFF
:2798 D_K[.3FF],R[4] K[.3FF] ; INITIALIZE SOME COUNTERS.
:2799 D-D.LEFT2,SI/ZERO
:2800 R[3] D
:2801 R[7] D
:2802 =0 D 0,CALL,J/DC.1DE ; SET UP UTRAP FLAG
:2803 R[0E] D
:2804 R[0F] 0
:2805 RC[0F],K[.6]

```

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U 10FC, 0000,003D,0180,0800,0000,114E
U 10FD, 0F00,003C,0180,0800,0000,10FE
U 10FE, 0000,003D,4980,3C00,0000,11AD
U 10FF, 0818,0038,8180,0AA0,0000,12B1
U 12B1, 0100,003C,0180,0800,0000,12B2
U 12B2, 0001,003C,0180,0A98,0000,12B3
U 12B3, 0001,003C,0180,0AB8,0000,110A
U 110A, 0F00,003D,0180,0800,0000,116C
U 110B, 0001,003C,0180,0AF0,0000,12B4
U 12B4, 0003,003C,0180,0AF8,0000,12B5
U 12B5, 0018,0038,D580,09F8,0000,1110

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:2806
U 1110. 0000.003D.0180.0800.0000.11AD :2807 =0
U 1111. 0F00.003C.0180.0A38.0200.12B6 :2808 MIDGOA: CALL J/SOFF ; DISABLE SBI CYCLES
U 12B6. 0000.003C.0180.9000.0000.1112 :2809 VA R[7],D 0 ; INVALIDATE GROUP 1
U 1112. 0000.003D.0180.0800.0000.11BE :2810 FS/MCT,MCT/INVALIDATE
U 1113. 0F00.003C.0180.0800.0000.12B7 :2811 =0 CALL J/ROM1S ; AND FILL GROUP 0 WITH 0'S
U 12B7. 0000.003C.0180.9800.0000.12B8 :2812 D 0
U 12B8. 0000.003C.0180.0A38.0010.12B9 :2813 FS/MCT,MCT/VALIDATE
U 12B9. 0000.013C.0180.0800.0000.1114 :2814 ALU_R[7],CLK.UBCC ; CONTINUE UNTIL ALL LOCATIONS WRITTEN
U 1114. 0018.0000.1180.0AB8.0000.1110 :2815 =0 R[7]_LA-K[.4],J/MIDGOA
U 1115. 0018.0038.D980.0A80.0000.12BA :2816 R[0]_K[.9] ; ADDRESS BIT COUNTER
U 12BA. 0018.0038.1180.0A88.0000.12BB :2817 R[1]_K[.4] ; LSB INCREMENT
U 12BB. 0018.0038.1980.0A90.0000.12BC :2818 R[2]_K[ZERO] ; MSB INCREMENT
U 12BC. 0003.003C.0180.0AA8.0000.12BD :2819 MIDGOB: R[5]_0 ; FORWARD SEQ FLAG
U 12BD. 0003.003C.0180.0AB0.0000.12BE :2820 R[6]_0 ; DATA IS ZERO
U 12BE. 0003.003C.0180.0AB8.0000.12BF :2821 R[7]_0 ; ADDRESS POINTER
U 12BF. 0000.003C.0180.0A20.0000.12C0 :2822 LAB R[4]
U 12C0. 0000.003C.0180.0AC0.0000.12C1 :2823 R[8]_LA ; ADDRESS COUNTER
U 12C1. 0000.003C.0180.0A38.0200.12C2 :2824 MIDGOC: VA R[7] ; READ CURRENT ADDRESS
U 12C2. 0000.003C.0180.09F0.0000.1008 :2825 RC[0E]_LA
U 1008. 0000.003D.0180.0800.0000.105C :2826 =00 CALL J7RHOM1 ; SHOULD BE A HIT IN GROUP 0
U 1009. 0000.003D.0180.0800.0000.1163 :2827 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 100A. 0000.003D.0180.0800.0000.1163 :2828 ERROR1 ; HIT/MISS BITS INCORRECT.
U 100B. 0000.003C.01C0.0A30.0000.12C3 :2829 Q R[6] ; CHECK DATA, EITHER 0 OR FFFFFFFF
U 12C3. 0001.203C.0180.09D8.0000.12C4 :2830 RC[0B]_0
U 12C4. 001D.2000.0180.0800.0010.12C5 :2831 ALU_Q-D,CLK.UBCC
U 12C5. 0000.013C.0180.0800.0000.1116 :2832 =0 Z? ; DATA INCORRECT.
U 1116. 0000.003D.0180.0800.0000.1163 :2833 ERROR1 ; WRITE COMPLEMENT DATA
U 1117. 0800.0028.0180.0A30.0000.12C6 :2834 LAB R[6],ALU_NOT.LA,D_ALU
U 12C6. 0001.003C.0180.09D8.0000.1010 :2835 RC[0B]_D
U 1010. 0000.003D.0180.0800.0000.11A6 :2836 =00 CALL J7WRITE ; WRITE GROUP 0
U 1011. 0000.003D.0180.0800.0000.1163 :2837 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 1012. 0000.003C.0180.0800.0000.1018 :2838 NOP
:2839 =
U 1018. 0000.003D.0180.0800.0000.105C :2840 =00 CALL J/RHOM1 ; READ DATA BACK
U 1019. 0000.003D.0180.0800.0000.1163 :2841 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 101A. 0000.003D.0180.0800.0000.1163 :2842 ERROR1 ; HIT/MISS BITS INCORRECT.
U 101B. 0010.0038.01C0.0958.0000.12C7 :2843 Q RC[0B] ; CHECK DATA READ, EITHER FFFFFFFF OR 0
U 12C7. 001D.2000.0180.0800.0010.12C8 :2844 A[U_Q-D,CLK.UBCC
U 12C8. 0000.013C.0180.0800.0000.1118 :2845 =0 Z? ; DATA INCORRECT.
U 1118. 0000.003D.0180.0800.0000.1163 :2846 ERROR1
U 1119. 0000.003C.0180.0A40.0010.12C9 :2847 ALU_R[8],CLK.UBCC
U 12C9. 0000.013C.0180.0800.0000.111A :2848 =0 Z?
U 111A. 0018.0000.0580.0AC0.0000.12CA :2849 R[8]_LA-K[.1],J/MIDGOD ; SEE IF ALL LOCATIONS HAVE BEEN TESTED.
U 111B. 0000.003C.0180.0800.0000.12D7 :2850 J/MIDGOF
U 12CA. 0000.003C.0180.0A28.0010.12CB :2851 MIDGOD: ALU_R[5],CLK.UBCC ; IF NOT SEE IF FORWARD OR BACKWARD SEQUENCE
U 12CB. 0000.013C.0180.0800.0000.111C :2852 =0 Z?
U 111C. 0000.003C.0180.0800.0000.12D1 :2853 J/MIDGOE
:2854 ; INCREMENT ADDRESS.
U 111D. 0000.003C.01C0.0A08.0000.12CC :2855 Q R[1] ; INCREMENT LSB'S
U 12CC. 0800.003C.0180.0A38.0000.12CD :2856 D-R[7]
U 12CD. 081D.2014.0180.0800.0000.12CE :2857 A[U_Q+D,D_ALU
U 12CE. 000D.0024.0180.0A18.0010.12CF :2858 LAB R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 12CF. 0000.013C.01C0.0A10.0000.111E :2859 Z?,Q R[2]
U 111E. 081D.2014.0180.0800.0000.111F :2860 =0 ALU_Q+D,D_ALU ; INCREMENT MSB'S
    
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U 111F, 0000,003C,01C0,0A18,0000,12D0 :2861      Q R[3]
U 12D0, 001D,0034,0180,0AB8,0000,12C1 :2862      ALU_D[AND]Q,R[7],ALU,J/MIDGOC ; CHECK NEXT LOCATION
:2863      ; DECREMENT ADDRESS.
U 12D1, 0000,003C,01C0,0A08,0000,12D2 :2864      MIDGOE: Q R[1] ; DECREMENT LSB'S
U 12D2, 0800,003C,0180,0A38,0000,12D3 :2865      D R[7]
U 12D3, 081D,0000,0180,0800,0000,12D4 :2866      ALU_D-Q,D,ALU
U 12D4, 000D,0024,0180,0A18,0010,12D5 :2867      LAB-R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 12D5, 0000,013C,01C0,0A10,0000,1120 :2868      Z?,Q R[2]
U 1120, 081D,0000,0180,0800,0000,1121 :2869      =0      ALU_D-Q,D,ALU ; DECREMENT MSB'S
U 1121, 0000,003C,01C0,0A18,0000,12D6 :2870      Q R[3]
U 12D6, 001D,0034,0180,0AB8,0000,12C1 :2871      ALU_D[AND]Q,R[7],ALU,J/MIDGOC ; CHECK NEXT LOCATION
U 12D7, 0000,003C,0180,0A30,0010,12D8 :2872      MIDGOF: ALU_R[6],CLK.UBCC ; IS DATA 0
U 12D8, 0000,013C,0180,0800,0000,1122 :2873      Z?
U 1122, 0000,003C,0180,0800,0000,12D0 :2874      =0      J/MIDGOF ; DATA#0
U 1123, 001B,0000,0580,0A80,0000,12D9 :2875      ALU_D-K[.1],R[6],ALU ; DATA=0
U 12D9, 0800,003C,0180,0A20,0000,12DA :2876      MIDGOG: D R[4] ; SET DATA TO FFFFFFFF AND CONTINUE
U 12DA, 0001,003C,0180,0AC0,0000,12DB :2877      R[8] D ; IN SAME DIRECTION
U 12DB, 0000,003C,0180,0A28,0010,12DC :2878      ALU_R[5],CLK.UBCC
U 12DC, 0800,013C,0180,0A18,0000,1124 :2879      Z?,D R[3]
U 1124, 0001,003C,0180,0AB8,0000,12C1 :2880      =0      R[7]-D,J/MIDGOC
U 1125, 0003,003C,0180,0AB8,0000,12C1 :2881      R[7]-0,J/MIDGOC
U 12DD, 0000,003C,0180,0A28,0010,12DE :2882      MIDGOH: ALU_R[5],CLK.UBCC ; SEE IF FOREWARD SEQ
U 12DE, 0000,013C,0180,0800,0000,1126 :2883      Z?
U 1126, 0000,003C,0180,0800,0000,12E0 :2884      =0      J/MIDGOI
U 1127, 0003,003C,0180,0A80,0000,12DF :2885      R[6] 0 ; IF FOREWARD SEQUENCE
U 12DF, 001B,0000,0580,0A88,0000,12D9 :2886      ALU_D-K[.1],R[5],ALU,J/MIDGOG ; CHANGE DIRECTION
U 12E0, 0000,003C,0180,0A00,0010,12E1 :2887      MIDGOI: ALU_R[0],CLK.UBCC ; IF WAS BACKWARD SEQ THEN SEE
U 12E1, 0000,013C,0180,0800,0000,1128 :2888      Z? ; IF ALL ADDRESS BITS HAVE BEEN USED AS LSB
U 1128, 0018,0000,0580,0A80,0000,12E2 :2889      =0      R[0] LA-K[.1],J/MIDGOJ
U 1129, 0000,003C,0180,0800,0000,12E6 :2890      J/MIDGOK ; IF YES DONE.
U 12E2, 0800,003C,0180,0A08,0000,12E3 :2891      MIDGOJ: D R[1] ; IF NOT CHANGE LSB AND CONTINUE
U 12E3, 0500,003C,0180,0800,0000,12E4 :2892      D-D,LEFT,SI/ZERO
U 12E4, 0001,003C,0180,0A88,0000,12E5 :2893      R[1] D
U 12E5, 0018,0038,1180,0A90,0000,12BC :2894      R[2]-K[.4],J/MIDGOB
U 12E6, 0000,003C,0180,0800,0000,112A :2895      MIDGOK: NOP
    
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2896 .PAGE "TEST E4 MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY"
2897 *****
2898 ++
2899 TEST E4 MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY
2900
2901 TEST DESCRIPTION
2902 THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP
2903 1'S DATA MEMORY.
2904
2905 LOGIC DESCRIPTION
2906 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
2907 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
2908 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
2909 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
2910 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
2911 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
2912 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
2913 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
2914 REGISTER ON THE SBI CONTROL MODULE.
2915
2916 ERROR DESCRIPTION
2917 VA REFERENCED
2918 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
2919 ONLY THE HIT AND MISS BITS ARE RELEVANT)
2920 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
2921 UTRAP OCCURS
2922 GOT CACHE MAINT REGISTER
2923 EXPECTED READ DATA
2924 GOT READ DATA
2925 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
2926 FLAG UTRAP TYPE
2927 ----
2928 1DE NO UTRAP OCCURRED
2929 DE CACHE PARITY UTRAP
2930 15E TB PARITY ERROR
2931 19E TB MISS
2932 1CE TB PROTECTION ERROR
2933 1D6 TB MODIFY BIT ERROR
2934 1DA X PAGE UTRAP
2935 1DC UNALIGNED DATA UTRAP
2936
2937
2938 *****
2939 =0
2940 MIDG1: NEWTST
2941 D 0
2942 =0 ID[TERO] D CALL J/SOFF ; TB AND SBI CYCLES OFF
2943 D_K[.3FF],R[4] K[.3FF] ; INITIALIZE SOME COUNTERS
2944 D-D,LEFT2,S1/ZERO
2945 R[3] D
2946 R[7] D
2947 =0 D 0, CALL J/DC.1DE ; SET UP UTRAP FLAG
2948 R[0E] D
2949 R[0F] D
2950 RC[0F],K[.6]
    
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U 112A, 0000,003D,0180,0800,0000,114E
U 112B, 0F00,003C,0180,0800,0000,112C
U 112C, 0000,003D,4980,3C00,0000,11AD
U 112D, 0818,0038,8180,0AA0,0000,12E7
U 12E7, 0100,003C,0180,0800,0000,12E8
U 12E8, 0001,003C,0180,0A98,0000,12E9
U 12E9, 0001,003C,0180,0AB8,0000,112E
U 112E, 0F00,003D,0180,0800,0000,116C
U 112F, 0001,003C,0180,0AF0,0000,12EA
U 12EA, 0003,003C,0180,0AF8,0000,12EB
U 12EB, 0018,0038,D580,09F8,0000,1130
    
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:2951
U 1130, 0000,003D,0180,0800,0000,11AD :2952
U 1131, 0F00,003C,0180,0A38,0200,12EC :2953
U 12EC, 0000,003C,0180,9000,0000,1132 :2954
U 1132, 0000,003D,0180,0800,0000,11C1 :2955
U 1133, 0F00,003C,0180,0800,0000,12ED :2956
U 12ED, 0000,003C,0180,9800,0000,12EE :2957
U 12EE, 0000,003C,0180,0A38,0010,12EF :2958
U 12EF, 0000,013C,0180,0800,0000,1134 :2959
U 1134, 0018,0000,1180,0AB8,0000,1130 :2960
U 1135, 0018,0038,0980,0A80,0000,12F0 :2961
U 12F0, 0018,0038,1180,0A88,0000,12F1 :2962
U 12F1, 0018,0038,1980,0A90,0000,12F2 :2963
U 12F2, 0003,003C,0180,0AA8,0000,12F3 :2964
U 12F3, 0003,003C,0180,0AB0,0000,12F4 :2965
U 12F4, 0003,003C,0180,0AB8,0000,12F5 :2966
U 12F5, 0000,003C,0180,0A20,0000,12F6 :2967
U 12F6, 0000,003C,0180,0AC0,0000,12F7 :2968
U 12F7, 0000,003C,0180,0A38,0200,12F8 :2969
U 12F8, 0000,003C,0180,09F0,0000,1038 :2970
U 1038, 0000,003D,0180,0800,0000,1060 :2971
U 1039, 0000,003D,0180,0800,0000,1163 :2972
U 103A, 0000,003D,0180,0800,0000,1163 :2973
U 103B, 0000,003C,01C0,0A30,0000,12F9 :2974
U 12F9, 0001,203C,0180,09D8,0000,12FA :2975
U 12FA, 001D,2000,0180,0800,0010,12FB :2976
U 12FB, 0000,013C,0180,0800,0000,1136 :2977
U 1136, 0000,003D,0180,0800,0000,1163 :2978
U 1137, 0800,0028,0180,0A30,0000,12FC :2979
U 12FC, 0001,003C,0180,09D8,0000,103C :2980
U 103C, 0000,003D,0180,0800,0000,11A6 :2981
U 103D, 0000,003D,0180,0800,0000,1163 :2982
U 103E, 0000,003C,0180,0800,0000,1040 :2983
:2984
U 1040, 0000,003D,0180,0800,0000,1060 :2985
U 1041, 0000,003D,0180,0800,0000,1163 :2986
U 1042, 0000,003D,0180,0800,0000,1163 :2987
U 1043, 0010,0038,01C0,0958,0000,12FD :2988
U 12FD, 001D,2000,0180,0800,0010,12FE :2989
U 12FE, 0000,013C,0180,0800,0000,1138 :2990
U 1138, 0000,003D,0180,0800,0000,1163 :2991
U 1139, 0000,003C,0180,0A40,0010,12FF :2992
U 12FF, 0000,013C,0180,0800,0000,113A :2993
U 113A, 0018,0000,0580,0AC0,0000,1300 :2994
U 113B, 0000,003C,0180,0800,0000,130D :2995
U 1300, 0000,003C,0180,0A28,0010,1301 :2996
U 1301, 0000,013C,0180,0800,0000,113C :2997
U 113C, 0000,003C,0180,0800,0000,1307 :2998
:2999
U 113D, 0000,003C,01C0,0A08,0000,1302 :3000
U 1302, 0800,003C,0180,0A38,0000,1303 :3001
U 1303, 081D,2014,0180,0800,0000,1304 :3002
U 1304, 000D,0024,0180,0A18,0010,1305 :3003
U 1305, 0000,013C,01C0,0A10,0000,113E :3004
U 113E, 081D,2014,0180,0800,0000,113F :3005

=0
MIDG1A: CALL J/SOFF ; TURN OFF SBI CYCLES
        VA R[7],D 0 ; INVALIDATE EVERY LOCATION IN
        FS/MCT,MCT/INVALIDATE ; GROUP 0 AND
        CALL J/RIMOS ; FILL GROUP 1 UP WITH 0
        D 0
        FS/MCT,MCT/VALIDATE
        ALU_R[7],CLK.UBCC ; CONTINUE UNTIL EVERY LOCATIO WRITTEN
        Z?
=0
R[7] LA-K[.4],J/MIDG1A
R[0] K[.9] ; ADDRESS BIT COUNTER
R[1] K[.4] ; LSB INCREMENT
R[2] K[ZERO] ; MSB INCREMENT
MIDG1B: R[5] 0 ; FOREWARD SEQ FLAG
        R[6] 0 ; DATA IS ZERO
        R[7] 0 ; ADDRESS POINTER
        LAB R[4]
        R[8] LA ; ADDRESS COUNTER
MIDG1C: VA R[7] ; READ CURRENT LOCATION
        RC[OE] LA
=00
CALL J/RMOH1 ; SHOULD BE A HIT IN GROUP 1
ERROR1 ; UNEXPECTED UTRAP OCCURRED
ERROR1 ; HIT/MISS BITS INCORRECT.
Q R[6] ; DATA SHOULD BE 0 OR FFFFFFFF
RC[OB] Q
ALU_Q-D,CLK.UBCC
Z?
=0
ERROR1 ; DATA INCORRECT.
LAB R[6],ALU_NOT.LA,D_ALU
RC[OB] D ; WRITE COMPLEMENT DATA
=00
CALL J/WRITE ; WRITE GROUP 1
ERROR1 ; UNEXPECTED UTRAP OCCURRED
NOP
=
=00
CALL J/RMOH1 ; READ THE DATA BACK
ERROR1 ; UNEXPECTED UTRAP OCCURRED
ERROR1 ; HIT/MISS BITS INCORRECT.
Q RC[OB] ; SHOULD BE FFFFFFFF OR 0
A[U_Q-D,CLK.UBCC
Z?
=0
ERROR1 ; DATA INCORRECT.
ALU_R[8],CLK.UBCC ; TESTED ALL LOCATIONS?
Z?
=0
R[8] LA-K[.1],J/MIDG1D ; IF NOT GO TO NEXT ADDRESS
J/MIDG1F
MIDG1D: ALU_R[5],CLK.UBCC ; SEE IF FOREWARD OR BACKWARD SEQ
Z?
=0
J/MIDG1E
; INCREMENT ADDRESS.
Q R[1] ; INCREMENT LSB'S
D-R[7]
A[U_Q+D,D_ALU
LAB-R[3],ALU_D[ANDNOT]LB,CLK.UBCC
Z?,Q R[2]
=0
ALU_Q+D,D_ALU ; INCREMENT MSB'S

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```

U 113F, 0000,003C,01C0,0A18,0000,1306 :3006      Q R[3]
U 1306, 001D,0034,0180,0AB8,0000,12F7 :3007      ALU_D[AND]Q,R[7],ALU,J/MIDG1C ; TEST NEXT LOCATION
                                           :3008      ; DECREMENT ADDRESS.
U 1307, 0000,003C,01C0,0A08,0000,1308 :3009      MIDG1E: Q R[1] ; DECREMENT LSB'S
U 1308, 0800,003C,0180,0A38,0000,1309 :3010      D R[7]
U 1309, 081D,0000,0180,0800,0000,130A :3011      ALU_D-Q,D,ALU
U 130A, 000D,0024,0180,0A18,0010,130B :3012      LAB_R[3],ALU_DEANDNOT]LB,CLK.UBCC
U 130B, 0000,013C,01C0,0A10,0000,1140 :3013      Z?,Q R[2]
U 1140, 081D,0000,0180,0800,0000,1141 :3014      =0      ALU_D-Q,D,ALU ; DECREMENT MSB'S
U 1141, 0000,003C,01C0,0A18,0000,130C :3015      Q R[3]
U 130C, 001D,0034,0180,0AB8,0000,12F7 :3016      ALU_D[AND]Q,R[7],ALU,J/MIDG1C ; TEST NEXT ADDRESS.
U 130D, 0000,003C,0180,0A30,0010,130E :3017      MIDG1F: ALU_R[6],CLK.UBCC ; SEE IF DATA 0 OR FFFFFFFF
U 130E, 0000,013C,0180,0800,0000,1142 :3018      Z?
U 1142, 0000,003C,0180,0800,0000,1313 :3019      =0      J/MIDG1H ; DATA#0
U 1143, 001B,0000,0580,0AB0,0000,130F :3020      ALU_0-K[.1],R[6],ALU ; DATA=0
U 130F, 0800,003C,0180,0A20,0000,1310 :3021      MIDG1G: D R[4] ; IF DATA 0 SET DATA TO FFFFFFFF
U 1310, 0001,003C,0180,0AC0,0000,1311 :3022      R[8] D ; AND CONTINUE IN THE SAME DIRECTION
U 1311, 0000,003C,0180,0A28,0010,1312 :3023      ALU_R[5],CLK.UBCC
U 1312, 0800,013C,0180,0A18,0000,1144 :3024      Z?,D R[3]
U 1144, 0001,003C,0180,0AB8,0000,12F7 :3025      =0      R[7]_D,J/MIDG1C
U 1145, 0003,003C,0180,0AB8,0000,12F7 :3026      R[7]_0,J/MIDG1C
U 1313, 0000,003C,0180,0A28,0010,1314 :3027      MIDG1H: ALU_R[5],CLK.UBCC ; IF DATA WAS FFFFFFFF SEE IF FOREWARD
U 1314, 0000,013C,0180,0800,0000,1146 :3028      Z? ; OR BACKWARD SEQ
U 1146, 0000,003C,0180,0800,0000,1316 :3029      =0      J/MIDG1I
U 1147, 0003,003C,0180,0AB0,0000,1315 :3030      R[6] 0 ; IF FOREWARD SEQ THEN CHANGE DIRECTION
U 1315, 001B,0000,0580,0AA8,0000,130F :3031      ALU_0-K[.1],R[5],ALU,J/MIDG1G
U 1316, 0000,003C,0180,0A00,0010,1317 :3032      MIDG1I: ALU_R[0],CLK.UBCC ; SEE IF EACH ADDRESS BIT HAS BEEN USED AS AN LSB
U 1317, 0000,013C,0180,0800,0000,1148 :3033      Z?
U 1148, 001B,0000,0580,0A80,0000,1318 :3034      =0      R[0] LA-K[.1],J/MIDG1J
U 1149, 0000,003C,0180,0800,0000,131C :3035      J/MIDG1K ; IF YES THEN DONE
U 1318, 0800,003C,0180,0A08,0000,1319 :3036      MIDG1J: D R[1] ; CHANGE ADDRESS LSB AND CONTINUE
U 1319, 0500,003C,0180,0800,0000,131A :3037      D_D.LEFT,SI/ZERO
U 131A, 0001,003C,0180,0A88,0000,131B :3038      R[1] D
U 131B, 0018,0038,1180,0A90,0000,12F2 :3039      R[2]_K[.4],J/MIDG1B
U 131C, 0000,003C,0180,0800,0000,114A :3040      MIDG1K: NOP
                                           :3041      =0
U 114A, 0000,003D,0180,0800,0000,114E :3042      DUMMY1: NEWTST
    
```

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ESKAH2F.MCR

Line Number Index

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Location / Line Number IndexSEQ 0682
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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1871=	1838	1845=	1861=	1862=	1863=	1839	2684=
U 1008	2826=	2827=	2828=	2829=	1952=	1953=	1840	2685=
U 1010	2836=	2837=	2838=	1841	1954=	1955=	1842	2711=
U 1018	2840=	2841=	2842=	2843=	1980=	1981=	1843	2712=
U 1020	2731=	2732=	2733=	2734=	2735=	2736=	2737=	2738=
U 1028	2739=	2740=	2741=	2742=	2743=	2744=	2745=	2746=
U 1030	2718=	2719=	2720=	2721=	2722=	2723=	2724=	2725=
U 1038	2971=	2972=	2973=	2974=	2981=	2982=	2983=	1844
U 1040	2985=	2986=	2987=	2988=	1983=	1984=	1986=	1987=
U 1048	1990=	1991=	1993=	1994=	1996=	1997=	1902=	1864
U 1050	2000=	2001=	2004=	2005=	2022=	2023=	2025=	2026=
U 1058	2035=	2036=	1905=	1865	2038=	2039=	1908=	1866
U 1060	2041=	2042=	2044=	2045=	2059=	2060=	2067=	2068=
U 1068	2081=	2082=	2129=	2130=	2132=	2133=	2137=	2138=
U 1070	2140=	2141=	2152=	2153=	2154=	2155=	2156=	2157=
U 1078	2187=	2188=	2189=	2190=	2252=	2253=	2254=	2255=
U 1080	2262=	2263=	2269=	2270=	2271=	2272=	2287=	2288=
U 1088	2289=	2290=	2293=	2294=	2295=	2296=	2298=	2299=
U 1090	2308=	2309=	2314=	2315=	2324=	2325=	2340=	2341=
U 1098	2342=	2343=	2346=	2347=	2348=	2349=	2351=	2352=
U 10A0	2361=	2362=	2400=	2401=	2402=	2403=	2409=	2410=
U 10A8	2412=	2413=	2414=	2415=	2429=	2430=	2431=	2432=
U 10B0	2435=	2436=	2438=	2439=	2443=	2444=	2449=	2450=
U 10B8	2455=	2456=	2457=	2458=	2472=	2473=	2474=	2475=
U 10C0	2478=	2479=	2481=	2482=	2486=	2487=	2527=	2528=
U 10C8	2529=	2530=	2536=	2537=	2539=	2540=	2542=	2543=
U 10D0	2558=	2559=	2560=	2561=	2563=	2564=	2566=	2567=
U 10D8	2571=	2572=	2577=	2578=	2583=	2584=	2599=	2600=
U 10E0	2601=	2602=	2604=	2605=	2607=	2608=	2612=	2613=
U 10E8	2648=	2649=	2666=	2667=	2669=	2671=	2677=	2678=
U 10F0	2680=	2681=	2690=	2691=	2694=	2696=	2702=	2703=
U 10F8	2705=	2706=	2707=	2708=	2795=	2796=	2797=	2798=
U 1100	1825=	1826=	1827=	1828=	1829=	1830=	1831=	1832=
U 1108	1833=	1867	2802=	2803=	1834=	1835=	1836=	1837=
U 1110	2807=	2808=	2810=	2811=	2815=	2816=	2833=	2834=
U 1118	2846=	2847=	2849=	2850=	2853=	2855=	2860=	2861=
U 1120	2869=	2870=	2874=	2875=	2880=	2881=	2884=	2885=
U 1128	2889=	2890=	2940=	2941=	2942=	2943=	2947=	2948=
U 1130	2952=	2953=	2955=	2956=	2960=	2961=	2978=	2979=
U 1138	2991=	2992=	2994=	2995=	2998=	3000=	3005=	3006=
U 1140	3014=	3015=	3019=	3020=	3025=	3026=	3029=	3030=
U 1148	3034=	3035=	3042=	1868	1869	1870	1880	1881
U 1150	1882	1883	1884	1885	1886	1928=	1887	1888
U 1158	1889	1890	1891	1892	1893	1894	1895	1896
U 1160	1897	1898	1899	1900	1901	1903	1904	1936
U 1168	1937	1943	1944	1945	1950	1951	1957	1958
U 1170	1959	1960	1961	1962	1963	1964	1965	1966
U 1178	1967	1968	1969	1970	2011=	2012=	2013=	2014=
U 1180	1971	1972	1973	1974	1975	1976	1977	1978
U 1188	1982	1988	1992	1998	2002	2006	2010	2020
U 1190	2024	2046	2047	2048	2049	2050	2051	2052
U 1198	2053	2054	2055	2056	2057	2058	2061	2062

UUUUUUUUUU

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2063	2064	2065	2066	2069	2070	2074	2075
U 11A8	2076	2077	2078	2079	2080	2088	2089	2090
U 11B0	2091	2093	2094	2095	2096	2098	2099	2101
U 11B8	2102	2104	2105	2107	2108	2109	2111	2112
U 11C0	2113	2115	2127	2131	2134	2135	2139	2142
U 11C8	2143	2144	2145	2146	2147	2148	2149	2150
U 11D0	2151	2158	2159	2160	2161	2162	2163	2164
U 11D8	2165	2166	2186	2191	2192	2193	2194	2195
U 11E0	2196	2197	2198	2199	2200	2201	2202	2203
U 11E8	2204	2205	2206	2207	2208	2209	2210	2256
U 11F0	2264	2265	2266	2267	2268	2273	2274	2275
U 11F8	2276	2277	2278	2279	2015:	2016:	2017:	2018:
U 1200	2280	2281	2282	2283	2284	2285	2286	2291
U 1208	2292	2297	2300	2301	2302	2303	2304	2305
U 1210	2306	2307	2316	2317	2318	2319	2320	2321
U 1218	2322	2323	2326	2327	2328	2329	2330	2331
U 1220	2332	2333	2334	2335	2336	2337	2338	2339
U 1228	2344	2345	2350	2353	2354	2355	2356	2357
U 1230	2358	2359	2360	2404	2411	2416	2417	2418
U 1238	2419	2420	2421	2422	2423	2424	2425	2426
U 1240	2427	2428	2433	2434	2437	2440	2441	2442
U 1248	2451	2452	2453	2454	2459	2460	2461	2462
U 1250	2463	2464	2465	2466	2467	2468	2469	2470
U 1258	2471	2476	2477	2480	2483	2484	2485	2531
U 1260	2538	2541	2544	2545	2546	2547	2548	2549
U 1268	2550	2551	2552	2553	2554	2555	2556	2557
U 1270	2562	2565	2568	2569	2570	2579	2580	2581
U 1278	2582	2585	2586	2587	2588	2589	2590	2591
U 1280	2592	2593	2594	2595	2596	2597	2598	2603
U 1288	2606	2609	2610	2611	2650	2651	2652	2653
U 1290	2654	2655	2656	2657	2658	2659	2660	2661
U 1298	2662	2668	2672	2673	2674	2675	2676	2679
U 12A0	2682	2683	2692	2693	2697	2698	2699	2700
U 12A8	2701	2704	1929:	2709	2710	2747	2748	2749
U 12B0	2750	2799	2800	2801	2804	2805	2809	2812
U 12B8	2813	2814	2817	2818	2819	2820	2821	2822
U 12C0	2823	2824	2825	2830	2831	2832	2835	2844
U 12C8	2845	2848	2851	2852	2856	2857	2858	2859
U 12D0	2862	2864	2865	2866	2867	2868	2871	2872
U 12D8	2873	2876	2877	2878	2879	2882	2883	2886
U 12E0	2887	2888	2891	2892	2893	2894	2895	2944
U 12E8	2945	2946	2949	2950	2954	2957	2958	2959
U 12F0	2962	2963	2964	2965	2966	2967	2968	2969
U 12F8	2970	2975	2976	2977	2980	2989	2990	2993
U 1300	2996	2997	3001	3002	3003	3004	3007	3009
U 1308	3010	3011	3012	3013	3016	3017	3018	3021
U 1310	3022	3023	3024	3027	3028	3031	3032	3033
U 1318	3036	3037	3038	3039	3040			
U 1320	- 13EF Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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Words not
in bounds

ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH2F	813

Used 813
Remaining

Total microwords used in memory U: 813

Total microwords remaining in memory U: 0

Highest address used in memory U: 13FF (hex)

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; The files used in this assembly are:

ESK00DEF.MIC

ESK00MAC.MIC

ESKAHMAC.MIC

ESKAH2F.MIC

Pass 1 warnings: 0 Pass 2 warnings: 0

Pass 1 errors: 0 Pass 2 errors: 0

CCCCCCCC

```

: 3      Control ROM Field Definitions
: 548    Register Transfer Macro Definitions
: 1413   Non-transfer Functions
: 1485   Branch Enable Macro Definitions
: 1564   MICRO DIAGNOSTIC DEFINED MACROS
: 1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2167   TEST E5 MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY
: 2322   TEST E6 MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY
: 2477   TEST E7 MDAL TEST 1
: 2635   TEST E8 MDAL TEST 2
: 2767   TEST E9 MDAL TEST 3
: 2870   TEST EA MDAL TEST 4
: 2973   TEST EB BAL TEST 1

```

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SEQ 0687
Page

```

;1          .NOLIST
;1804       .LIST
;1805

```

[illegible]


```

:1806      .TOC      'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807      .REGION/1000,13FF
:1808      :+
:1809      : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1810      : WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1811      : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1812      : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1813      : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1814
:1815      : FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1816      : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1817      : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1818      : R[OF] AND DO A RETURN0.
:1819
:1820      : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1821      : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1822      : TO THE CONSOLE.
:1823
:1824      :-
U 1100, 0000,003C,1980,0800,0084,7003 :1825 1100: SC_K[ZERO],J/TRPH1      : SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001 :1826 1101: SC_K[.1],J/TRPH0      : DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001 :1827 1102: SC_K[.2],J/TRPH0      : X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001 :1828 1103: SC_K[.3],J/TRPH0      : TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001 :1829 1104: SC_K[.4],J/TRPH0      : TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001 :1830 1105: SC_K[.6],J/TRPH0      : TB MISS
U 1106, 0000,003C,D980,0800,0084,7001 :1831 1106: SC_K[.9],J/TRPH0      : RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001 :1832 1107: SC_K[.7],J/TRPH0      : TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001 :1833 1108: SC_K[.8],J/TRPH0      : CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003 :1834 110C: SC_K[.C],J/TRPH1      : RDS
U 110D, 0000,003C,8980,0800,0084,7003 :1835 110D: SC_K[.D],J/TRPH1      : TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001 :1836 110E: SC_K[.10],J/TRPH0     : ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003 :1837 110F: SC_K[.F],J/TRPH1     : CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F :1838 TRPH0: Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B :1839      Q_D,D,Q
U 105B, 0000,003C,8180,3C00,0000,105F :1840      ID[USTACK],D
U 105F, 0C00,003C,01E0,0800,0000,1109 :1841      Q_D,D,Q
U 1109, 0000,003C,01C0,0A78,0000,111B :1842      Q-R[OF]
U 111B, 0001,2024,0180,0800,0010,111C :1843      ALU_Q.ANDNOT.MASK,CLK.UBCC      : WAS TRAP EXPECTED?
U 111C, 0000,013C,0180,0800,0000,1002 :1844      Z?                          : BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000 :1845      =0      ALU_Q.AND.MASK,R[OF],ALU,RETURN0 ; CLEAR THE BIT AND RETURN
:1846      :+
:1847      : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1848      : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1849      : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1850
:1851      : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1852      : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1853      : FAULT STATUS REGISTER
:1854      : SBI ERROR REGISTER
:1855      : TIMEOUT ADDRESS REGISTER
:1856      : MAINTENANCE REGISTER
:1857      : CACHE PARITY REGISTER
:1858      : TB ERROR REGISTER 1
:1859      : TB ERROR REGISTER 0
:1860      :-

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ZZ-ESKAH-V132 Subroutines
ESKAH30.MCR

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U 1003, 0018,0038,1D80,09E8,0000,1014 :1861
U 1014, 0000,003D,D980,0800,0084,713E :1862
U 1015, 0000,003C,49F0,2C00,0000,111D :1863
U 111D, 0001,203C,4DF0,2D80,0000,111E :1864
U 111E, 0001,203C,65F0,2D88,0000,111F :1865
U 111F, 0001,203C,6DF0,2DD8,0000,1120 :1866
U 1120, 0001,203C,75F0,2DE0,0000,1121 :1867
U 1121, 0001,203C,79F0,2DC8,0000,1122 :1868
U 1122, 0001,203C,69F0,2DC0,0000,1123 :1869
U 1123, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1138 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 1124, 0000,003C,65F8,0800,0084,7125 :1880
U 1125, 0818,0038,8D80,0800,0000,1126 :1881
U 1126, 0D00,003C,0180,0800,0000,1127 :1882
U 1127, 0000,003C,3D80,3C00,0000,1128 :1883
U 1128, 0818,0038,0580,0800,0000,1129 :1884
U 1129, 0D00,003C,0180,0800,0000,112A :1885
U 112A, 0F00,003C,3180,3C00,0000,112B :1886
U 112B, 0000,003C,5D80,3C00,0000,112C :1887
U 112C, 0000,003C,3980,3C00,0000,112D :1888
U 112D, 0000,003C,2980,3C00,0000,112E :1889
U 112E, 0000,003C,4980,3C00,0000,112F :1890
U 112F, 0818,0038,C180,0800,0000,1130 :1891
U 1130, 0000,003C,6580,3C00,0000,1131 :1892
U 1131, 0F00,003C,6D80,3C00,0000,1132 :1893
U 1132, 0000,003C,6D80,3C00,0000,1133 :1894
U 1133, 0000,003C,6580,3C00,0000,1134 :1895
U 1134, 0003,003C,0180,09F0,0000,1135 :1896
U 1135, 0003,003C,0180,0AF8,0000,1136 :1897
U 1136, 0003,003C,0180,09E8,0000,105E :1898
U 1137, 0818,0038,0980,0800,0000,105E :1899
U 1138, 0810,0038,0180,0978,0000,1139 :1900
U 1139, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 113A, 0810,0038,0180,0978,0000,113B :1903
U 113B, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905
:1906
:1907
U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

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```

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6]-Q,Q_ID[TBER1]
RC[7]-Q,Q_ID[SBI.ERR]
RC[0B]-Q,Q_ID[FAULT]
RC[0C]-Q,Q_ID[MAINT]
RC[9]-Q,Q_ID[PARITY]
RC[8]-Q,Q_ID[TIME.ADDR]
RC[0A]-Q,Q_ID[USTACK]
1000: RC[0E]-Q,ERROR1

```

```

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

```

```

: NEWTST
: ERLOOP
: ERROR1
: ERROR2

```

```

SCOPE: SC K[.10],Q_0

```

```

: SETUP TO WRITE IPL OF 1F
: ...

```

```

: WRITE THE PSL
: SETUP TO CLEAR THE CES REGISTER

```

```

: CLEAR THE CES REGISTER
: SHUT OFF THE FLOATING POINT
: CLEAR THE SIR REGISTER
: STOP INTERVAL TIMER
: SHUT OFF THE TB

```

```

ERLOOP: D_K[.2],J/CALLCON
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:

```

```

: CALL THE CONSOLE
: ERRLOOP CALL

```

```

ID[TXDB]_D,J/CALLCON

```

```

: CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
U 13F9, 0000,003C,0180,0800,0000,13FA :1921
U 13FA, 0000,003C,0180,0800,0000,13FB :1922
U 13FB, 0000,003C,0180,0800,0000,13FC :1923
U 13FC, 0000,003C,0180,0800,0000,13FD :1924
U 13FD, 0000,003C,0180,0800,0000,13FE :1925
U 13FE, 0000,003C,0180,0800,0000,13FF :1926
U 13FF, 0000,003C,0180,0800,0000,1155 :1927
U 1155, 0000,003C,0180,0800,0000,12AA :1928
U 12AA, 0000,003C,0180,0800,0000,113C :1929
:1930
:1931
:1932
:1933
:1934
:1935
U 113C, 0810,0038,4D80,0978,0000,113D :1936
U 113D, 0019,4016,4D80,09F8,0000,0001 :1937
:1938
:1939
:1940
:1941
:1942
U 113E, 0010,0038,01C0,0978,0000,113F :1943
U 113F, 0019,2034,4DC0,0800,0000,1140 :1944
U 1140, 0019,2032,1D80,09F8,0000,0001 :1945
:1946
:1947
:1948
:1949
U 1141, 0018,0038,C180,0800,0000,1142 :1950
U 1142, 0500,003C,0380,0800,0000,1016 :1951
U 1016, 0000,003D,0180,0800,0000,1154 :1952
U 1017, 0000,003C,0180,0800,0000,1018 :1953
U 1018, 0000,003D,0180,0800,0000,1156 :1954
U 1019, 0000,003E,0180,0800,0000,0001 :1955
:1956
U 1143, 0118,0038,1B80,0800,0000,1158 :1957
U 1144, 0118,0038,0B80,0800,0000,1158 :1958
U 1145, 0118,0038,0780,0800,0000,1158 :1959
U 1146, 0118,0038,C380,0800,0000,1158 :1960
U 1147, 0018,0038,1980,0800,0000,1143 :1961
U 1148, 0018,0038,1980,0800,0000,1144 :1962
U 1149, 0018,0038,1980,0800,0000,1145 :1963
U 114A, 0018,0038,1980,0800,0000,1146 :1964
U 114B, 0018,0038,0980,0800,0000,1143 :1965
U 114C, 0018,0038,0980,0800,0000,1144 :1966
U 114D, 0018,0038,0980,0800,0000,1145 :1967
U 114E, 0018,0038,0980,0800,0000,1146 :1968
U 114F, 0018,0038,0580,0800,0000,1143 :1969
U 1150, 0018,0038,0580,0800,0000,1144 :1970

13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
1155: NOP
12AA: NOP

:+
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
:-

SUBTST: D RC[OF],KMX/.FF00
RC[OF],D+K[.FF00],WORD,RETURN1

:+
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:-

SETRCF: Q RC[OF]
Q-Q.AND.K[.FF00]
RC[OF],Q.OR.SC,RETURN1

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
: USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
: CERTAIN TRAPS.

DC.1DE: ALU_K[.FFFF]
D D.LEFT,S1/7
=0 CALL,J/DCD
NOP
=0 CALL,J/DCE
RETURN1

: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.

S00: ALU_0(K),D D.LEFT2,S1/7,J/SX
S01: ALU_K[.2],D D.LEFT2,S1/7,J/SX
S10: ALU_K[.1],D D.LEFT2,S1/7,J/SX
S11: ALU_K[.FFFF],D D.LEFT2,S1/7,J/SX
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01

ZZ-ESKAH-V132 Subroutines
ESKAH30.MCR

MICRO2 1M(01)

16-DEC-82 11:49:58

U 1151,	0018,0038,0580,0800,0000,1145	:1971	DCA:	ALU_K[.1],J/S10
U 1152,	0018,0038,0580,0800,0000,1146	:1972	DCB:	ALU_K[.1],J/S11
U 1153,	0018,0038,C180,0800,0000,1143	:1973	DCC:	ALU_K[.FFFF],J/S00
U 1154,	0018,0038,C180,0800,0000,1144	:1974	DCD:	ALU_K[.FFFF],J/S01
U 1156,	0018,0038,C180,0800,0000,1145	:1975	DCE:	ALU_K[.FFFF],J/S10
U 1157,	0018,0038,C180,0800,0000,1146	:1976	DCF:	ALU_K[.FFFF],J/S11
U 1158,	0100,003E,0380,0800,0000,0001	:1977	SX:	D_D.LEFT2,S1/7,RETURN1
U 1159,	0018,0038,01C0,0800,0000,101A	:1978	DC.5:	Q_K[.8]
		:1979	=0	
U 101A,	0000,003D,0180,0800,0000,114C	:1980	DC.5A:	CALL,J/DC5
U 101B,	0019,2000,05C0,0800,0010,115A	:1981		ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 115A,	0000,013C,0180,0800,0000,101C	:1982		Z?
U 101C,	0000,003C,0180,0800,0000,101A	:1983	=0	J/DC.5A
U 101D,	0000,003E,0180,0800,0000,0001	:1984		RETURN1
		:1985	=0	
U 101E,	0000,003D,0180,0800,0000,1159	:1986	DC.A:	CALL,J/DC.5
U 101F,	0500,003E,0180,0800,0000,0001	:1987		D_D.LEFT,S1/ZERO,RETURN1
U 115B,	0018,0038,01C0,0800,0000,1020	:1988	DC.9:	Q_K[.8]
		:1989	=0	
U 1020,	0000,003D,0180,0800,0000,1150	:1990	DC.9A:	CALL,J/DC9
U 1021,	0019,2000,05C0,0800,0010,115C	:1991		ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 115C,	0000,013C,0180,0800,0000,1022	:1992		Z?
U 1022,	0000,003C,0180,0800,0000,1020	:1993	=0	J/DC.9A
U 1023,	0000,003E,0180,0800,0000,0001	:1994		RETURN1
		:1995	=0	
U 1024,	0000,003D,0180,0800,0000,115B	:1996	DC.C:	CALL,J/DC.9
U 1025,	0018,0038,C180,0800,0000,115D	:1997		ALU_K[.FFFF]
U 115D,	0600,003E,0380,0800,0000,0001	:1998		D_D.RIGHT,S1/7,RETURN1
		:1999	=0	
U 1026,	0000,003D,0180,0800,0000,115B	:2000	DC.6:	CALL,J/DC.9
U 1027,	0018,0038,0580,0800,0000,115E	:2001		ALU_K[.1]
U 115E,	0100,003E,0380,0800,0000,0001	:2002		D_D.LEFT2,S1/7,RETURN1
		:2003	=0	
U 1028,	0000,003D,0180,0800,0000,115B	:2004	DC.3:	CALL,J/DC.9
U 1029,	0018,0038,C180,0800,0000,115F	:2005		ALU_K[.FFFF]
U 115F,	0500,003E,0380,0800,0000,0001	:2006		D_D.LEFT,S1/7,RETURN1
		:2007	; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED	
		:2008	; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB	
		:2009	; WHICH COULD RESULT IN ERROR CONDITIONS.	
U 1160,	0000,003F,0180,0800,0000,117C	:2010	TARGC3:	SUB/SPEC
U 117C,	0000,003E,0180,0800,0000,0001	:2011	117C:	RETURN1
U 117D,	0000,003E,0180,0800,0000,0002	:2012	117D:	RETURN2
U 117E,	0000,003E,0180,0800,0000,0003	:2013	117E:	RETURN3
U 117F,	0000,003E,0180,0800,0000,0004	:2014	117F:	RETURN4
U 11FC,	0000,003D,0180,0800,0000,1138	:2015	11FC:	ERROR1
U 11FD,	0000,003D,0180,0800,0000,1138	:2016	11FD:	ERROR1
U 11FE,	0000,003D,0180,0800,0000,1138	:2017	11FE:	ERROR1
U 11FF,	0000,003D,0180,0800,0000,1138	:2018	11FF:	ERROR1
		:2019	; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.	
U 1161,	0F18,0038,5DC0,0800,0000,102A	:2020	DCLA:	D_0,Q_K[.7]
		:2021	=0	
U 102A,	0000,003D,0180,0800,0000,1151	:2022	DCLA1:	CALL,J/DCA
U 102B,	0001,203C,0180,0800,0010,1162	:2023		ALU_Q,CLK.UBCC
U 1162,	0000,013C,0180,0800,0000,102C	:2024		Z?
U 102C,	0019,2000,05C0,0800,0000,102A	:2025	=0	Q_Q-K[.1],J/DCLA1


```

U 102D, 0000,003E,0180,0800,0000,0001 :2026
:2027
:2028
:2029
:2030
:2031
:2032
:2033
:2034
U 102E, 0F00,003D,0180,0800,0000,114D :2035
U 102F, 0000,003C,0180,0800,0000,1035 :2036
:2037
U 1030, 0F00,003D,0180,0800,0000,1149 :2038
U 1031, 0000,003C,0180,0800,0000,1035 :2039
:2040
U 1032, 0F00,003D,0180,0800,0000,114B :2041
U 1033, 0000,003C,0180,0800,0000,1035 :2042
:2043
U 1034, 0F00,003C,0180,0800,0000,1035 :2044
U 1035, 0000,003C,01F8,0800,0084,7163 :2045
U 1163, 0D00,003C,0180,0800,0000,1164 :2046
U 1164, 0001,003C,0180,09E8,0000,1165 :2047
U 1165, 0000,003C,0180,0A70,0000,1166 :2048
U 1166, 0000,003C,0180,52F8,0000,1167 :2049
U 1167, 0001,003C,0180,09D0,0000,1168 :2050
U 1168, 0000,003C,75F0,2C00,0000,1169 :2051
U 1169, 0800,003C,0180,0A78,0000,116A :2052
U 116A, 0003,003C,0180,0AF8,0000,116B :2053
U 116B, 0001,203C,0180,09E0,0000,116C :2054
U 116C, 0000,003C,01C0,0A70,0000,116D :2055
U 116D, 0001,003C,0180,09C8,0000,116E :2056
U 116E, 001D,2000,0180,0800,0010,116F :2057
U 116F, 0000,013C,0180,0800,0000,1036 :2058
U 1036, 0000,003C,0180,0800,0000,1176 :2059
U 1037, 0818,0038,D5F8,0800,0000,1170 :2060
U 1170, 0000,003C,0180,0800,0084,7171 :2061
U 1171, 0D10,0038,01C0,0960,0000,1172 :2062
U 1172, 001D,2034,01C0,0800,0000,1173 :2063
U 1173, 0810,0038,0180,0968,0000,1174 :2064
U 1174, 001D,2000,0180,0800,0010,1175 :2065
U 1175, 0000,013C,0180,0800,0000,1038 :2066
U 1038, 0000,003E,0180,0800,0000,0002 :2067
U 1039, 0810,003A,0180,0950,0000,0003 :2068
U 1176, 0000,003C,79F0,2C00,0000,1177 :2069
U 1177, 0001,203E,0180,09E8,0000,0001 :2070
:2071
:2072
:2073
U 1178, 0000,003C,0180,0A70,0000,1179 :2074
U 1179, 0000,003C,0180,32F8,0000,117A :2075
U 117A, 0800,003C,0180,0A78,0000,117B :2076
U 117B, 0003,003C,0180,0AF8,0000,1180 :2077
U 1180, 0000,003C,01C0,0A70,0000,1181 :2078
U 1181, 001D,2000,0180,0800,0010,1182 :2079
U 1182, 0000,013C,0180,0800,0000,103A :2080

```

```

RETURN1
: THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
: THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
: IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
: UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
: IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
: TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
: WILL CONTAIN THE READ DATA.
=0
RMOH1: D 0,CALL,J/DC6
J7READ
=0
RMOH1: D 0,CALL,J/DC2
J7READ
=0
RMOH1: D 0,CALL,J/DC4
J7READ
=0
RMOM1: D 0,J/READ
READ: SC K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
D DAL.SC
RC[OD] D
LAB R[OE]
RC[OF] LA,FS/MCT,MCT/READ.V.WCHK
RC[OA] D
Q_ID[MAINT]
D_R[OF]
RC[OF] 0
RC[OC] Q
Q R[OE]
RC[9] D
ALU_Q=D,CLK.UBCC
Z?
=0
J/RERR
Q 0,D,K[.6]
SC K[.8]
D DAL.SC,Q RC[OC]
ACU Q[AND]D,Q_ALU
D RC[OD]
ACU_Q=D,CLK.UBCC
Z?
=0
RETURN2
D RC[OA],RETURN3
RERR: Q_ID[PARITY]
RC[OD] Q,RETURN1
: THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
: AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
: ELSE RETURN2.
WRITE: LAB R[OE]
RC[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
D R[OF]
RC[OF] 0
Q R[OE]
ACU_Q=D,CLK.UBCC
Z?

```

```

U 103A, 0000,003C,0180,0800,0000,1176 :2081
U 103B, 0000,003E,0180,0800,0000,0002 :2082
                                           :2083
                                           :2084
                                           :2085
                                           :2086
                                           :2087
U 1183, 0F00,003C,0180,0800,0000,1184 :2088
U 1184, 0000,003C,8580,0800,0084,7185 :2089
U 1185, 0801,001C,0180,0800,0000,1186 :2090
U 1186, 0000,003E,7580,3C00,0000,0001 :2091
                                           :2092
U 1187, 0F00,003C,0180,0800,0000,1188 :2093
U 1188, 0000,003C,6180,0800,0084,7189 :2094
U 1189, 0000,003C,0580,0800,0084,818A :2095
U 118A, 0801,001C,0180,0800,0000,1184 :2096
                                           :2097
U 118B, 0F00,003C,0180,0800,0000,118C :2098
U 118C, 0000,003C,8980,0800,0084,718A :2099
                                           :2100
U 118D, 0F00,003C,0180,0800,0000,118E :2101
U 118E, 0000,003C,6580,0800,0084,718A :2102
                                           :2103
U 118F, 0F00,003C,0180,0800,0000,1190 :2104
U 1190, 0000,003C,6180,0800,0084,718A :2105
                                           :2106
U 1191, 0F00,003C,0180,0800,0000,1192 :2107
U 1192, 0000,003C,6180,0800,0084,7193 :2108
U 1193, 0801,001C,0180,0800,0000,118E :2109
                                           :2110
U 1194, 0F00,003C,0180,0800,0000,1195 :2111
U 1195, 0000,003C,6180,0800,0084,7196 :2112
U 1196, 0801,001C,0180,0800,0000,1188 :2113
                                           :2114
U 1197, 0F00,003C,8980,0800,0084,7193 :2115
                                           :2116
                                           :2117
                                           :2118
                                           :2119
                                           :2120
                                           :2121
                                           :2122
                                           :2123
                                           :2124
                                           :2125
                                           :2126
U 1198, 0F18,0038,5DC0,0800,0000,103C :2127
                                           :2128
U 103C, 0000,003D,0180,0800,0000,1151 :2129
U 103D, 0001,203C,0180,0800,0010,1199 :2130
U 1199, 0000,013C,0180,0800,0000,103E :2131
U 103E, 0019,2000,05C0,0800,0000,103C :2132
U 103F, 0001,003C,0180,0980,0000,119A :2133
U 119A, 0001,0028,0180,0990,0000,119B :2134
U 119B, 0F18,0038,5DC0,0800,0000,1040 :2135

```

```

=0      J/RERR                      : UTRAPPED.
        RETURN2                     : OK NO UTRAP.
: THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
: REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
: CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
: NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
: DISSABLE SBI CYCLES:
SOFF:   D 0
S1:     SC K[C]
        ALU D,ORNOT.MASK,D,ALU
        ID[MAINT] D,RETURN
: SET FORCE REPLACE GROUP ZERO BIT
ROS:    D 0
S2:     SC K[F]
        SC SC-K[.1]
S3:     ALU D,ORNOT.MASK,D,ALU,J/S1
: SET FORCE REPLACE GROUP T BIT
RIS:    D 0
S4:     SC K[D],J/S3
: SET FORCE MISS GROUP 0 BIT
MOS:    D 0
S5:     SC K[.10],J/S3
: SET FORCE MISS GROUP 1 BIT
MIS:    D 0
S6:     SC K[F],J/S3
: SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
M1OS:   D 0
        SC K[F]
S7:     ALU D,ORNOT.MASK,D,ALU,J/S5
: SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
ROMIS:  D 0
        SC K[F]
        ALU D,ORNOT.MASK,D,ALU,J/S2
: SET FORCE REPLACE GROUP T FORCE MISS GROUP 0 BITS
R1MOS:  D 0,SC K[D],J/S7
: THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
: PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
: THESE PATTERNS IN THE RC SCRATCH PADS.
: RC[0]
: RC[1]
: RC[2]
: RC[3]
: RC[4]
: RC[5]
: RC[6]
: RC[7]
: CAPAT: Q_K[.7],D_0
=0
CAP1:   CALL J/DCA
        ALU Q,CLK.UBCC
        Z?
=0      Q Q-K[.1],J/CAP1
        RC[0] D
        ALU NOT.D,RC[2],ALU
        Q_K[.7],D_0

```

U 1040.	0000,003D,0180,0800,0000,1150	:2136	=0	
U 1041.	0001,203C,0180,0800,0010,119C	:2137	CAP2:	CALL,J/DC9
U 119C.	0000,013C,0180,0800,0000,1042	:2138		ALU_Q,CLK.UBCC
U 1042.	0019,2000,05C0,0800,0000,1040	:2139		Z?
U 1043.	0001,003C,0180,09A0,0000,119D	:2140	=0	Q_Q-K[.1],J/CAP2
U 119D.	0001,0028,0180,0980,0000,119E	:2141		RC[4] D
U 119E.	0000,003C,89F8,0800,0084,719F	:2142		ALU_NOT.D,RC[6]_ALU
U 119F.	0D00,003C,0180,0800,0000,11A0	:2143		Q_0,SC_K[.D]
U 11A0.	0600,003C,0180,0800,0000,11A1	:2144		D_DAL.SC
U 11A1.	0001,003C,0180,0988,0000,11A2	:2145		D_D.RIGHT,SI/ZERO
U 11A2.	0810,0038,65F8,0930,0084,71A3	:2146		RC[1] D
U 11A3.	0D00,003C,0180,0800,0000,11A4	:2147		D_RC[8],SC_K[.10],Q_0
U 11A4.	0200,003C,0180,0800,0000,11A5	:2148		D_DAL.SC
U 11A5.	0200,003C,0180,0800,0000,11A6	:2149		D_D.RIGHT2,SI/ZERO
U 11A6.	0F01,003C,0180,0998,0000,1044	:2150		D_D.RIGHT2,SI/ZERO
U 1044.	0000,003D,0180,0800,0000,1150	:2151		RC[3] D,D_0
U 1045.	0100,003C,0180,0800,0000,1046	:2152	=0	CALL,J/DC9
U 1046.	0000,003D,0180,0800,0000,1150	:2153		D_D.LEFT2,SI/ZERO
U 1047.	0500,003C,0180,0800,0000,1048	:2154	=0	CALL,J/DC9
U 1048.	0000,003D,0180,0800,0000,114B	:2155		D_D.LEFT,SI/ZERO
U 1049.	0001,0028,0180,09A8,0000,11A7	:2156	=0	CALL,J/DC4
U 11A7.	0000,003C,85F8,0800,0084,71A8	:2157		ALU_NOT.D,RC[5]_ALU
U 11A8.	0D00,003C,0180,0800,0000,11A9	:2158		SC_RC[.C],Q_0
U 11A9.	0001,003C,0180,0988,0000,11AA	:2159		D_DAL.SC
U 11AA.	0810,0038,0180,0928,0000,11AB	:2160		RC[7] D
U 11AB.	0000,003C,61F8,0800,0084,71AC	:2161		D_RC[5]
U 11AC.	0D00,003C,0180,0800,0000,11AD	:2162		SC_K[.F],Q_0
U 11AD.	0200,003C,0180,0800,0000,11AE	:2163		D_DAL.SC
U 11AE.	0600,003C,0180,0800,0000,11AF	:2164		D_D.RIGHT2,SI/ZERO
U 11AF.	0001,003E,0180,09A8,0000,0001	:2165		D_D.RIGHT,SI/ZERO
		:2166		RC[5]_D,RETURN1

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2167 .PAGE "TEST E5 MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY"
2168 *****
2169 ++
2170 TEST E5 MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY
2171
2172 TEST DESCRIPTION
2173 THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP 0'S
2174 ADDRESS MEMORY.
2175
2176 LOGIC DESCRIPTION
2177 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
2178 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
2179 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
2180 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
2181 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
2182 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
2183 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
2184 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
2185 REGISTER ON THE SBI CONTROL MODULE.
2186
2187 ERROR DESCRIPTION
2188 VA REFERENCED
2189 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
2190 ONLY THE HIT AND MISS BITS ARE RELEVANT)
2191 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
2192 UTRAP OCCURS
2193 GOT CACHE MAINT REGISTER
2194 EXPECTED READ DATA
2195 GOT READ DATA
2196 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
2197 FLAG UTRAP TYPE
2198 ----
2199 1DE NO UTRAP OCCURRED
2200 DE CACHE PARITY UTRAP
2201 15E TB PARITY ERROR
2202 19E TB MISS
2203 1CE TB PROTECTION ERROR
2204 1D6 TB MODIFY BIT ERROR
2205 1DA X PAGE UTRAP
2206 1DC UNALIGNED DATA UTRAP
2207
2208 --
2209 *****
2210 =0
2211 MIAGO: NEWTST
2212 D 0
2213 =0 ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
2214 D_K[.3FF]
2215 D_D.LEFT2,S1/ZERO
2216 R[7]_D ; SET UP A COUNTER
2217 =0 D 0,CALL,J/DC.1DE ; SET UP THE UTRAP FLAG
2218 R[OE]_D
2219 R[OF]_0
2220 RC[OF]_K[.6]
2221 =0
    
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U 104A, 0000,003D,0180,0800,0000,1124
U 104B, 0F00,003C,0180,0800,0000,104C
U 104C, 0000,003D,4980,3C00,0000,1183
U 104D, 0818,0038,8180,0800,0000,1180
U 11B0, 0100,003C,0180,0800,0000,11B1
U 11B1, 0001,003C,0180,0AB8,0000,1050
U 1050, 0F00,003D,0180,0800,0000,1141
U 1051, 0001,003C,0180,0AF0,0000,11B2
U 11B2, 0003,003C,0180,0AF8,0000,11B3
U 11B3, 0018,0038,D580,09F8,0000,1052
    
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U 1052, 0000,003D,0180,0800,0000,1183 :2222 MIAGOA: CALL J/SOFF ; CLEAR FORCE REPLACE BITS
U 1053, 0F00,003C,0180,0A38,0200,1184 :2223 VA R[7],D 0 ; INVALIDATE EVERY LOCATION IN GROUP 1
U 11B4, 0000,003C,0180,9000,0000,1054 :2224 FS/MCT,MCT/INVALIDATE
U 1054, 0000,003D,0180,0800,0000,1194 :2225 =0 CALL J/ROM1S ; AND CLEAR EVERY LOCATION IN GROUP 0 TAG MEMORY
U 1055, 0800,003C,0180,0A38,0000,1185 :2226 D R[7]
U 11B5, 0000,003C,0180,9800,0000,1186 :2227 FS/MCT,MCT/VALIDATE
U 11B6, 0000,003C,0180,0A38,0010,1187 :2228 ALU_R[7],CLK.UBCC
U 11B7, 0000,013C,0180,0800,0000,1056 :2229 Z?
U 1056, 0018,0000,1180,0A88,0000,1052 :2230 =0 R[7]_LA-K[.4],J/MIAGOA
U 1057, 0018,0038,0180,0A80,0000,1188 :2231 R[0]-K[.8] ; MSB COUNTER
U 11B8, 0018,0038,0180,0A88,0000,1189 :2232 R[1]-K[.8] ; LSB INCREMENT
U 11B9, 0018,0038,1980,0A90,0000,11BA :2233 R[2]-K[ZERO] ; MSB INCREMENT
U 11BA, 0018,0038,49C0,0800,0000,11BB :2234 Q_K[.FF]
U 11BB, 0000,003C,03A8,0800,0000,11BC :2235 Q-Q.LEFT,S1/7
U 11BC, 0001,203C,0180,0AA0,0000,11BD :2236 R[4] Q ; =1FF ADDRESS COUNTER
U 11BD, 0000,003C,0188,0800,0000,11BE :2237 Q-Q.LEFT2,S1/ZERO
U 11BE, 0000,003C,01A8,0800,0000,11BF :2238 Q-Q.LEFT,S1/ZERO
U 11BF, 0001,203C,0180,0A98,0000,11C0 :2239 R[3] Q ; =FFB ADDRESS MASK
U 11C0, 0000,003C,8580,0800,0084,71C1 :2240 SC_K[.C]
U 11C1, 0803,0010,6580,0800,0084,91C2 :2241 ALU_MASK+1,D_ALU,SC_SC+K[.10]
U 11C2, 0000,003C,0180,0800,0080,D1C3 :2242 SC_SC+1 ; SC=29.
U 11C3, 0003,0010,01C0,0800,0000,11C4 :2243 ALU_MASK+1,Q_ALU
U 11C4, 001D,0024,0180,0AD0,0000,11C5 :2244 ALU_D[ANDNOT]Q,R[0A]_ALU ; R[0A]=1FFFF000
U 11C5, 0003,003C,0180,0A88,0000,11C6 :2245 MIAGOB: R[5] 0 ; SET FORWARD SEQ
U 11C6, 0003,003C,0180,0AB0,0000,11C7 :2246 R[6] 0 ; SET ADDRESS<28:12>=0
U 11C7, 0003,003C,0180,0A88,0000,11C8 :2247 R[7] 0 ; ADDRESS POINTER
U 11C8, 0000,003C,0180,0A20,0000,11C9 :2248 LAB R[4]
U 11C9, 0000,003C,0180,0AC0,0000,11CA :2249 R[8] LA ; ADDRESS COUNTER
U 11CA, 0800,003C,0180,0A38,0000,11CB :2250 MIAGOC: D R[7] ; CHECK CURRENT LOCATION
U 11CB, 0001,003C,0180,09D8,0000,11CC :2251 R[0B]_D
U 11CC, 0000,003C,01C0,0A30,0000,11CD :2252 Q R[6]
U 11CD, 001D,2030,0180,09F0,0200,1004 :2253 A[U_Q[OR]D,VA_ALU,R[0E]_ALU ; ADDRESS TAG IS EITHER 00000XXX OR 1FFFF000
U 1004, 0000,003D,0180,0800,0000,1030 :2254 =0 CALL J/RHOM1 ; CHECK GROUP 0 HIT
U 1005, 0000,003D,0180,0800,0000,1138 :2255 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 1006, 0000,003D,0180,0800,0000,1138 :2256 ERROR1 ; HIT/MISS BITS INCORRECT
U 1007, 0010,0038,01C0,0958,0000,11CE :2257 Q R[0B] ; CHECK DATA
U 11CE, 001D,2000,0180,0800,0010,11CF :2258 A[U_Q-D,CLK.UBCC
U 11CF, 0000,013C,0180,0800,0000,1058 :2259 Z?
U 1058, 0000,003D,0180,0800,0000,1138 :2260 =0 ERROR1 ; DATA INCORRECT
U 1059, 0810,0038,0180,0970,0000,11D0 :2261 D_R[0E] ; COMPLEMENT THE TAG IN THIS LOCATION
U 11D0, 0000,003C,01C0,0A50,0000,11D1 :2262 Q_R[0A]
U 11D1, 001D,2020,0180,09F0,0200,105C :2263 A[U_Q[XOR]D,VA_ALU,R[0E]_ALU
U 105C, 0000,003D,0180,0800,0000,1194 :2264 =0 CALL J/ROM1S ; SET FORCE MISS GROUP 1 FORCE REPLACE GROUP 0 BITS
U 105D, 0800,003C,0180,0A38,0000,11D2 :2265 D R[7]
U 11D2, 0000,003C,0180,9800,0000,1008 :2266 FS/MCT,MCT/VALIDATE ; WRITE GROUP 0
U 1008, 0000,003D,0180,0800,0000,1030 :2267 =0 CALL J/RHOM1 ; READ GROUP 0 HIT
U 1009, 0000,003D,0180,0800,0000,1138 :2268 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 100A, 0000,003D,0180,0800,0000,1138 :2269 ERROR1 ; HIT/MISS BITS INCORRECT
U 100B, 0010,0038,01C0,0958,0000,11D3 :2270 Q R[0B] ; CHECK DATA
U 11D3, 001D,2000,0180,0800,0010,11D4 :2271 A[U_Q-D,CLK.UBCC
U 11D4, 0000,013C,0180,0800,0000,1060 :2272 Z?
U 1060, 0000,003D,0180,0800,0000,1138 :2273 =0 ERROR1 ; DATA INCORRECT
U 1061, 0000,003C,0180,0A40,0010,11D5 :2274 ALU_R[8],CLK.UBCC ; CHECKED ALL LOCATIONS?
U 11D5, 0000,013C,0180,0800,0000,1062 :2275 Z?
U 1062, 0018,0000,0580,0AC0,0000,11D6 :2276 =0 R[8]_LA-K[.1],J/MIAGOD ; IF NOT GO COMPUTE NEXT ADDRESS

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U 1063. 0000,003C,0180,0800,0000,11E3 :2277
U 11D6. 0000,003C,0180,0A28,0010,11D7 :2278
U 11D7. 0000,013C,0180,0800,0000,1064 :2279
U 1064. 0000,003C,0180,0800,0000,11DD :2280
U 1065. 0000,003C,01C0,0A08,0000,11D8 :2281
U 11D8. 0800,003C,0180,0A38,0000,11D9 :2282
U 11D9. 081D,2014,0180,0800,0000,11DA :2283
U 11DA. 000D,0024,0180,0A18,0010,11DB :2284
U 11DB. 0000,013C,01C0,0A10,0000,1066 :2285
U 1066. 081D,2014,0180,0800,0000,1067 :2286
U 1067. 0000,003C,01C0,0A18,0000,11DC :2287
U 11DC. 001D,0034,0180,0AB8,0000,11CA :2288
U 11DD. 0000,003C,01C0,0A08,0000,11DE :2289
U 11DE. 0800,003C,0180,0A38,0000,11DF :2290
U 11DF. 081D,0000,0180,0800,0000,11E0 :2291
U 11E0. 000D,0024,0180,0A18,0010,11E1 :2292
U 11E1. 0000,013C,01C0,0A10,0000,1068 :2293
U 1068. 081D,0000,0180,0800,0000,1069 :2294
U 1069. 0000,003C,01C0,0A18,0000,11E2 :2295
U 11E2. 001D,0034,0180,0AB8,0000,11CA :2296
U 11E3. 0000,003C,0180,0A30,0010,11E4 :2297
U 11E4. 0000,013C,0180,0800,0000,106A :2298
U 106A. 0000,003C,0180,0800,0000,11EA :2299
U 106B. 0000,003C,0180,0A50,0000,11E5 :2300
U 11E5. 0000,003C,0180,0AB0,0000,11E6 :2301
U 11E6. 0800,003C,0180,0A20,0000,11E7 :2302
U 11E7. 0001,003C,0180,0AC0,0000,11E8 :2303
U 11E8. 0000,003C,0180,0A28,0010,11E9 :2304
U 11E9. 0800,013C,0180,0A18,0000,106C :2305
U 106C. 0001,003C,0180,0AB8,0000,11CA :2306
U 106D. 0003,003C,0180,0AB8,0000,11CA :2307
U 11EA. 0000,003C,0180,0A28,0010,11EB :2308
U 11EB. 0000,013C,0180,0800,0000,106E :2309
U 106E. 0000,003C,0180,0800,0000,11ED :2310
U 106F. 0003,003C,0180,0AB0,0000,11EC :2311
U 11EC. 001B,0000,0580,0AA8,0000,11E6 :2312
U 11ED. 0000,003C,0180,0A00,0010,11EE :2313
U 11EE. 0000,013C,0180,0800,0000,1070 :2314
U 1070. 0018,0000,0580,0A80,0000,11EF :2315
U 1071. 0000,003C,0180,0800,0000,11F3 :2316
U 11EF. 0800,003C,0180,0A08,0000,11F0 :2317
U 11F0. 0500,003C,0180,0800,0000,11F1 :2318
U 11F1. 0001,003C,0180,0A88,0000,11F2 :2319
U 11F2. 0018,0038,0180,0A90,0000,11C5 :2320
U 11F3. 0000,003C,0180,0800,0000,1072 :2321

MIAGOD: J/MIAGOF
ALU_R[5],CLK.UBCC ; SEE IF FOREWARD OR BACKWARD DIRECTION
Z?
=0 J/MIAGOE
Q_R[1] ; IF FOREWARD INCREMENT LSB'S
D_R[7]
ACU_Q+D,D_ALU
LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
Z?,Q_R[2]
=0 ALU_Q+D,D_ALU ; INCREMENT MSB'S
Q_R[3]
ACU_D[AND]Q,R[7]_ALU,J/MIAGOC ; GO TEST NEXT ADDRESS
MIAGOE: Q_R[1] ; IF BACK WARD DECREMENT LSB'S
D_R[7]
ACU_D-Q,D_ALU
LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
Z?,Q_R[2]
=0 ALU_D-Q,D_ALU ; DECREMENT MSB'S
Q_R[3]
ACU_D[AND]Q,R[7]_ALU,J/MIAGOC ; GO TEST NEXT ADDRESS
MIAGOF: ALU_R[6],CLK.UBCC ; IS TAG PATTERN 00000XXX
Z?
=0 J/MIAGOH
LAB_R[0A] ; ADDR<28:12>=1'S
R[6]_LA ; IF YES SET TAG TO 1FFFFXX
MIAGOG: D_R[4] ; AND CONTINUE IN THE SAME DIRECTION
R[8]_D
ALU_R[5],CLK.UBCC
Z?,D_R[3]
=0 R[7]_D,J/MIAGOC
R[7]_O,J/MIAGOC
MIAGOH: ALU_R[5],CLK.UBCC ; IS DIRECT FOREWARD
Z?
=0 J/MIAGOI
R[6]_O ; IF WAS FOREWARD SET DIRECTION
ALU_D-K[.1],R[5]_ALU,J/MIAGOG ; TO BACKWARD AND CONTINUE
MIAGOI: ALU_R[0],CLK.UBCC ; HAVE ALL ADDRESS BITS USED
Z? ; AS THE LSB?
=0 R[0]_LA-K[.1],J/MIAGOJ
J/MIAGOK ; IF YES THEN DONE.
MIAGOJ: D_R[1] ; ELSE SHIFT THE LSB LEFT IN THE ADDRESS
D-D.LEFT,S1/ZERO
R[1]_D
R[2]_K[.8],J/MIAGOB
MIAGOK: NOP
  
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:2322 .PAGE 'TEST E6 MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY'
:2323 *****
:2324 ++
:2325 TEST E6 MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY
:2326
:2327 TEST DESCRIPTION
:2328 THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP 1'S
:2329 ADDRESS MEMORY.
:2330
:2331 LOGIC DESCRIPTION
:2332 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2333 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2334 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2335 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2336 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2337 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2338 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2339 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2340 REGISTER ON THE SBI CONTROL MODULE.
:2341
:2342 ERROR DESCRIPTION
:2343 VA REFERENCED
:2344 EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
:2345 ONLY THE HIT AND MISS BITS ARE RELEVANT)
:2346 OR GOT CACHE PARITY REGISTER IF UNEXPECTED
:2347 UTRAP OCCURS
:2348 GOT CACHE MAINT REGISTER
:2349 EXPECTED READ DATA
:2350 GOT READ DATA
:2351 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2352 FLAG UTRAP TYPE
:2353 ----
:2354 1DE NO UTRAP OCCURRED
:2355 DE CACHE PARITY UTRAP
:2356 15E TB PARITY ERROR
:2357 19E TB MISS
:2358 1CE TB PROTECTION ERROR
:2359 1D6 TB MODIFY BIT ERROR
:2360 1DA X PAGE UTRAP
:2361 1DC UNALIGNED DATA UTRAP
:2362
:2363 --
:2364 *****
:2365 =0
:2366 MIAG1: NEWTST
:2367 D 0
:2368 =0 ID[TBRO]_D,CALL,J/SOFF ; TB AND SBI CYCLE S OFF
:2369 D_K[.3FF] ; INITIALIZE A COUNTER
:2370 D-D.LEFT2,SI/ZERO
:2371 R[7]_D
:2372 =0 D 0,CALL,J/DC.1DE ; SET UP UTRAP FLAG
:2373 R[OE]_D
:2374 R[OF]_0
:2375 RC[OF]_K[.6]
:2376 =0
    
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U 1072, 0000,003D,0180,0800,0000,1124
U 1073, 0F00,003C,0180,0800,0000,1074
U 1074, 0000,003D,4980,3C00,0000,1183
U 1075, 0818,0038,8180,0800,0000,11F4
U 11F4, 0100,003C,0180,0800,0000,11F5
U 11F5, 0001,003C,0180,0A88,0000,1076
U 1076, 0F00,003D,0180,0800,0000,1141
U 1077, 0001,003C,0180,0AF0,0000,11F6
U 11F6, 0003,003C,0180,0AF8,0000,11F7
U 11F7, 0018,0038,D580,09F8,0000,1078
    
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U 1078. 0000,003D,0180,0800,0000,1183 :2377 MIAG1A: CALL J/SOFF ; CLEAR FORCE REPLACE BITS
U 1079. 0F00,003C,0180,0A38,0200,11F8 :2378 VA R[7],D 0 ; INVALIDATE EVERY LOCATION
U 11F8. 0000,003C,0180,9000,0000,107A :2379 FS/MCT,MCT/INVALIDATE ; IN GROUP 0
U 107A. 0000,003D,0180,0800,0000,1197 :2380 =0 CALL J/R1MOS ; AND CLEAR THE TAG MEMORY OF GROUP 1
U 107B. 0800,003C,0180,0A38,0000,11F9 :2381 D R[7]
U 11F9. 0000,003C,0180,9800,0000,11FA :2382 FS/MCT,MCT/VALIDATE
U 11FA. 0000,003C,0180,0A38,0010,11FB :2383 ALU_R[7],CLK.UBCC
U 11FB. 0000,013C,0180,0800,0000,107C :2384 Z?
U 107C. 0018,0000,1180,0A88,0000,1078 :2385 =0 R[7]_LA-K[.4],J/MIAG1A
U 107D. 0018,0038,0180,0A80,0000,1200 :2386 R[0]-K[.8] ; MSB COUNTER
U 1200. 0018,0038,0180,0A88,0000,1201 :2387 R[1]-K[.8] ; LSB INCREMENT
U 1201. 0018,0038,1980,0A90,0000,1202 :2388 R[2]-K[ZERO] ; MSB INCREMENT
U 1202. 0018,0038,49C0,0800,0000,1203 :2389 Q_K[.FF]
U 1203. 0000,003C,03A8,0800,0000,1204 :2390 Q-Q.LEFT,SI/7
U 1204. 0001,203C,0180,0AA0,0000,1205 :2391 R[4] Q ; =1FF ADDRESS COUNTER
U 1205. 0000,003C,0188,0800,0000,1206 :2392 Q-Q.LEFT2,SI/ZERO
U 1206. 0000,003C,01A8,0800,0000,1207 :2393 Q-Q.LEFT,SI/ZERO
U 1207. 0001,203C,0180,0A98,0000,1208 :2394 R[3] Q ; =FF8 ADDRESS MASK
U 1208. 0000,003C,8580,0800,0084,7209 :2395 SC_K[.C]
U 1209. 0803,0010,6580,0800,0084,920A :2396 ALD_MASK+1,D_ALU,SC_SC+K[.10]
U 120A. 0000,003C,0180,0800,0080,D20B :2397 SC_SC+1 ; SC=29.
U 120B. 0003,0010,01C0,0800,0000,120C :2398 ALD_MASK+1,Q_ALU
U 120C. 001D,0024,0180,0AD0,0000,120D :2399 ALU_D[ANDNOT]Q,R[0A]_ALU ; R[0A]=1FFFF000
U 120D. 0003,003C,0180,0AA8,0000,120E :2400 MIAG1B: R[5]-0 ; SET FORWARD SEQ
U 120E. 0003,003C,0180,0AB0,0000,120F :2401 R[6]-0 ; SET ADDRESS<28:12>=0
U 120F. 0003,003C,0180,0AB8,0000,1210 :2402 R[7]-0 ; ADDRESS POINTER
U 1210. 0000,003C,0180,0A20,0000,1211 :2403 LAB R[4]
U 1211. 0000,003C,0180,0AC0,0000,1212 :2404 R[8]_LA ; ADDRESS COUNTER
U 1212. 0800,003C,0180,0A38,0000,1213 :2405 MIAG1C: D R[7] ; READ CURRENT ADDRESS, TAG IS 00000xxx OR 1FFFF000
U 1213. 0001,003C,0180,09D8,0000,1214 :2406 R[0B]_D
U 1214. 0000,003C,01C0,0A30,0000,1215 :2407 Q R[6]
U 1215. 001D,2030,0180,09F0,0200,100C :2408 ALU_Q[OR]D,VA_ALU,R[0E]_ALU
U 100C. 0000,003D,0180,0800,0000,1032 :2409 =00 CAL J/RMOH1 ; READ GROUP1 HIT
U 100D. 0000,003D,0180,0800,0000,1138 :2410 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 100E. 0000,003D,0180,0800,0000,1138 :2411 ERROR1 ; HIT/MISS BITS INCORRECT
U 100F. 0010,0038,01C0,0958,0000,1216 :2412 Q_R[0B] ; CHECK THE DATA READ
U 1216. 001D,2000,0180,0800,0010,1217 :2413 ALU_Q-D,CLK.UBCC
U 1217. 0000,013C,0180,0800,0000,107E :2414 Z?
U 107E. 0000,003D,0180,0800,0000,1138 :2415 =0 ERROR1 ; DATA INCORRECT
U 107F. 0810,0038,0180,0970,0000,1218 :2416 D_R[0E] ; COMPLEMENT THE TAG IN THIS LOCATION
U 1218. 0000,003C,01C0,0A50,0000,1219 :2417 Q-R[0A]
U 1219. 001D,2020,0180,09F0,0200,1080 :2418 ALU_Q[XOR]D,VA_ALU,R[0E]_ALU
U 1080. 0000,003D,0180,0800,0000,1197 :2419 =0 CAL J/R1MOS ; SET THE FORCE REPLACE GROUP 1 AND FORCE MISS GROUP
U 1081. 0800,003C,0180,0A38,0000,121A :2420 D R[7]
U 121A. 0000,003C,0180,9800,0000,1010 :2421 FS/MCT,MCT/VALIDATE ; WRITE GROUP 1
U 1010. 0000,003D,0180,0800,0000,1032 :2422 =00 CALL J/RMOH1 ; READ THE COMPLEMENTED TAG
U 1011. 0000,003D,0180,0800,0000,1138 :2423 ERROR1 ; UNEXPECTED UTRAP OCCURRED
U 1012. 0000,003D,0180,0800,0000,1138 :2424 ERROR1 ; HIT/MISS BITS INCORRECT
U 1013. 0010,0038,01C0,0958,0000,121B :2425 Q_R[0B] ; CHECK THE DATA
U 121B. 001D,2000,0180,0800,0010,121C :2426 ALU_Q-D,CLK.UBCC
U 121C. 0000,013C,0180,0800,0000,1082 :2427 Z?
U 1082. 0000,003D,0180,0800,0000,1138 :2428 =0 ERROR1 ; DATA INCORRECT
U 1083. 0000,003C,0180,0A40,0010,121D :2429 ALU_R[8],CLK.UBCC ; TESTED ALL LOCATION?
U 121D. 0000,013C,0180,0800,0000,1084 :2430 Z?
U 1084. 0018,0000,0580,0AC0,0000,121E :2431 =0 R[8]_LA-K[.1],J/MIAG1D ; IF NOT GO COMPUTE NEXT LOCATION
    
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U 1085. 0000.003C.0180.0800.0000.122B :2432
U 121E. 0000.003C.0180.0A28.0010.121F :2433
U 121F. 0000.013C.0180.0800.0000.1086 :2434
U 1086. 0000.003C.0180.0800.0000.1225 :2435
U 1087. 0000.003C.01C0.0A08.0000.1220 :2436
U 1220. 0800.003C.0180.0A38.0000.1221 :2437
U 1221. 081D.2014.0180.0800.0000.1222 :2438
U 1222. 000D.0024.0180.0A18.0010.1223 :2439
U 1223. 0000.013C.01C0.0A10.0000.1088 :2440
U 1088. 081D.2014.0180.0800.0000.1089 :2441
U 1089. 0000.003C.01C0.0A18.0000.1224 :2442
U 1224. 001D.0034.0180.0A88.0000.1212 :2443
U 1225. 0000.003C.01C0.0A08.0000.1226 :2444
U 1226. 0800.003C.0180.0A38.0000.1227 :2445
U 1227. 081D.0000.0180.0800.0000.1228 :2446
U 1228. 000D.0024.0180.0A18.0010.1229 :2447
U 1229. 0000.013C.01C0.0A10.0000.108A :2448
U 108A. 081D.0000.0180.0800.0000.108B :2449
U 108B. 0000.003C.01C0.0A18.0000.122A :2450
U 122A. 001D.0034.0180.0A88.0000.1212 :2451
U 122B. 0000.003C.0180.0A30.0010.122C :2452
U 122C. 0000.013C.0180.0800.0000.108C :2453
U 108C. 0000.003C.0180.0800.0000.1232 :2454
U 108D. 0000.003C.0180.0A50.0000.122D :2455
U 122D. 0000.003C.0180.0A80.0000.122E :2456
U 122E. 0800.003C.0180.0A20.0000.122F :2457
U 122F. 0001.003C.0180.0AC0.0000.1230 :2458
U 1230. 0000.003C.0180.0A28.0010.1231 :2459
U 1231. 0800.013C.0180.0A18.0000.108E :2460
U 108E. 0001.003C.0180.0A88.0000.1212 :2461
U 108F. 0003.003C.0180.0A88.0000.1212 :2462
U 1232. 0000.003C.0180.0A28.0010.1233 :2463
U 1233. 0000.013C.0180.0800.0000.1090 :2464
U 1090. 0000.003C.0180.0800.0000.1235 :2465
U 1091. 0003.003C.0180.0A80.0000.1234 :2466
U 1234. 001B.0000.0580.0A88.0000.122E :2467
U 1235. 0000.003C.0180.0A00.0010.1236 :2468
U 1236. 0000.013C.0180.0800.0000.1092 :2469
U 1092. 0018.0000.0580.0A80.0000.1237 :2470
U 1093. 0000.003C.0180.0800.0000.123B :2471
U 1237. 0800.003C.0180.0A08.0000.1238 :2472
U 1238. 0500.003C.0180.0800.0000.1239 :2473
U 1239. 0001.003C.0180.0A88.0000.123A :2474
U 123A. 0018.0038.0180.0A90.0000.120D :2475
U 123B. 0000.003C.0180.0800.0000.1094 :2476

MIAG1D: J/MIAG1F
ALU_R[5],CLK.UBCC ; FOREWARD SEQ?
Z?
=0 J/MIAG1E
Q_R[1] ; IF FOREWARD SEQ INCREMENT LSB'S
D_R[7]
ALU_Q+D,D_ALU
LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
Z?,Q_R[2]
=0 ALU_Q+D,D_ALU ; INCREMENT MSB'S
Q_R[3]
MIAG1E: ALU_D[AND]Q,R[7],ALU,J/MIAG1C ; TEST NEXT LOCATION
Q_R[1] ; IF BACKWARD SEQ DECREMENT LSB'S
D_R[7]
ALU_D-Q,D_ALU
LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
Z?,Q_R[2]
=0 ALU_D-Q,D_ALU ; DECREMENT MSB'S
Q_R[3]
MIAG1F: ALU_D[AND]Q,R[7],ALU,J/MIAG1C ; TEST NEXT LOCATION
ALU_R[6],CLK.UBCC ; TAG=00000XXX?
Z?
=0 J/MIAG1H
LAB_R[0A] ; ADDR<28:12>=1'S
R[6] LA ; IF TAG=00000XXX MAKE TAG=1FFFFXXX
MIAG1G: D_R[7] ; AND CONTINUE IN SAME DIRECTION
R[8] D
ALU_R[5],CLK.UBCC
Z?,D_R[3]
=0 R[7]-D,J/MIAG1C
R[7]-Q,J/MIAG1C
MIAG1H: ALU_R[5],CLK.UBCC ; FOREWARD DIRECTION
Z?
=0 J/MIAG1I
R[6] 0 ; IF FOREWARD DIRECT ENTER BACKWARD DIRECTION
ALU_D-K[.1],R[5],ALU,J/MIAG1G
MIAG1I: ALU_R[0],CLK.UBCC ; HAVE ALL ADDRESS BITS BEEN USED AS THE LSB
Z?
=0 R[0] LA-K[.1],J/MIAG1J
J/MIAG1K ; IF YES THEN DONE
MIAG1J: D_R[1] ; OTHERWISE SHIFT ADDRESS LSB
D-D.LEFT,SI/ZERO ; SET FOREWARD SEQ AND TAG=00000XXX
R[1] D
R[2]-K[.8],J/MIAG1B
MIAG1K: NOP
  
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.PAGE "TEST E7 MDAL TEST 1"
*****
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TEST E7 MDAL TEST 1

TEST DESCRIPTION
THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING DT=LONG
AND VA<01:00>= 11, 10 AND 01. EACH OF THESE CONDITIONS
IS TRIED AS A FIRST REFERENCE (WHICH WILL RESULT IN A UTRAP)
AND THEN AS A SECOND REFERENCE.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.

ERROR DESCRIPTION
DATA AT LOCATION 0
DATA AT LOCATION 4
DATA READ
EXPECTED DATA READ
ADDRESS READ
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

ERROR FLAG (FOR FAILCHAIN)
0=>ERROR ON FIRST REFERENCE
1=>ERROR ON SECOND REFERENCE

--
*****
=0
MDAL1: NEWTST
D 0,R[0F]_0
=0 ID[1BER0]_0,CALL,J/SOFF ; TB AND SBI CYCLES OFF
RC[0F] K[-7]
=0 D 0,CALL,J/DCLA ; GENERATE SOME CONSTANTS
R[6] D ; FOR THE TEST, R[6]=AAAAAAA
ALU 0-K[.1],D_ALU,Q_0
SC_R[.FFF8]
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U 1094, 0000,003D,0180,0800,0000,1124
U 1095, 0F03,003C,0180,0AF8,0000,1096
U 1096, 0000,003D,4980,3C00,0000,1183
U 1097, 0018,0038,5D80,09F8,0000,1098
U 1098, 0F00,003D,0180,0800,0000,1161
U 1099, 0001,003C,0180,0AB0,0000,123C
U 123C, 081B,0000,05F8,0800,0000,123D
U 123D, 0000,003C,7180,0800,0084,723E

U 123E, 0D00,003C,0180,0800,0000,123F :2532
U 123F, 0001,003C,0180,0AC8,0000,1240 :2533
U 1240, 0000,003C,0D80,0800,0084,7241 :2534
U 1241, 0D00,003C,0180,0800,0000,1242 :2535
U 1242, 0001,003C,0180,0AC0,0000,1243 :2536
U 1243, 0018,0038,0D80,0AB8,0000,109A :2537
U 109A, 0F00,003D,0180,0800,0000,1141 :2538
U 109B, 0001,003C,0180,0AF0,0000,1244 :2539
U 1244, 0F18,0038,1980,0800,0200,1245 :2540
U 1245, 0000,003C,0180,9000,0000,1246 :2541
U 1246, 0000,003C,0180,0803,0000,1247 :2542
U 1247, 0000,003C,0180,9000,0000,1248 :2543
U 1248, 0000,003C,01C0,0A48,0000,1249 :2544
U 1249, 0F19,2014,05C0,0800,0000,124A :2545
U 124A, 0600,003C,0080,0800,0000,124B :2546
U 124B, 0001,003C,0180,0AD0,0000,124C :2547
U 124C, 0001,203C,0180,0AD8,0000,124D :2548
U 124D, 0018,0038,8D80,0AE0,0000,109C :2549
U 109C, 0000,003D,0180,0800,0000,1137 :2550
U 109D, 0003,003C,0180,09C0,0000,124E :2551
U 124E, 0800,003C,0180,0A40,0000,124F :2552
U 124F, 080D,0024,0180,0A50,0000,1250 :2553
U 1250, 0001,003C,0180,09F0,0000,109E :2554
U 109E, 0018,0039,1980,0800,0200,1187 :2555
U 109F, 0810,0038,0180,0970,0000,1251 :2556
U 1251, 0000,003C,0180,9800,0000,1252 :2557
U 1252, 0800,003C,0180,0A48,0000,1253 :2558
U 1253, 080D,0024,0180,0A58,0000,1254 :2559
U 1254, 0001,003C,0180,09E8,0000,1255 :2560
U 1255, 0018,0038,1180,0800,0200,1256 :2561
U 1256, 0000,003C,0180,9800,0000,1257 :2562
U 1257, 0800,003C,0180,0A38,0000,1258 :2563
U 1258, 0001,003C,0180,09D0,0200,1259 :2564
U 1259, 0800,003C,0180,0A30,0000,125A :2565
U 125A, 0000,003C,0180,0A70,0000,125B :2566
U 125B, 0000,003C,0180,0AF8,0000,125C :2567
U 125C, 0000,003C,0180,5000,0000,125D :2568
U 125D, 0001,003C,0180,09E0,0000,125E :2569
U 125E, 0800,003C,0180,0A78,0000,125F :2570
U 125F, 0003,003C,0180,0AF8,0000,1260 :2571
U 1260, 0000,003C,01C0,0A70,0000,1261 :2572
U 1261, 001D,2000,0180,0800,0010,1262 :2573
U 1262, 0000,013C,0180,0800,0000,10A0 :2574
U 10A0, 0000,003C,0180,0800,0000,1263 :2575
U 10A1, 0001,003D,0180,09C8,0000,1138 :2576
U 1263, 0019,0034,0980,0800,0010,1264 :2577
U 1264, 0000,013C,0180,0800,0000,10A2 :2578
U 10A2, 0001,003D,0180,09C8,0000,1138 :2579
U 10A3, 0018,0038,11C0,0800,0000,1265 :2580
U 1265, 0800,003C,0180,0A38,0000,1266 :2581
U 1266, 081D,2000,0180,0800,0000,1267 :2582
U 1267, 0500,003C,0180,0800,0000,1268 :2583
U 1268, 0100,003C,0180,0800,0000,1269 :2584
U 1269, 0001,003C,0180,0AA8,0082,126A :2585
U 126A, 0F10,0038,01C0,0970,0000,126B :2586

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D DAL.SC
R[9] D ; R[9]=00FFFFFF
SC K[.18]
D DAL.SC
R[8] D ; R[8]=FF000000
R[7] K[.3] ; USED AS THE ADDRESS
D 0,CALL,J/DC.1DE ; SET UP UTRAP FLAG
R[OE] D
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0
FS/MCT,MCT/INVALIDATE ; IN BOTH GROUPS.
VA VA+4 ; INVALIDATE LOCATION 4
FS/MCT,MCT/INVALIDATE ; IN BOTH GROUPS.
MDAL1A: Q R[9] ; INITIALIZE FLOATING PATTERN
ALU Q+K[.1],Q,ALU,D 0 ; FOR MEMORY DATA
D D.RIGHT,Q,Q.RIGHT,S1/ASHR
R[OA] D
R[OB] Q
R[OC] K[.1F] ; INITIALIZE COUNT FOR PATTERN
ERLOOP
RC[8] 0 ; ERROR FLAG => FIRST REFERENCE
MDAL1B: D R[8] ; GENERATE PATTERN OF FLOATING 0 IN 1'S
LAB R[OA],ALU_D[ANDNOT]LB,D_ALU ; TO BE WRITTEN INTO LOCATION 0
RC[OE] D
VA K[ZERO],CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D RC[OE]
FS/MCT,MCT/VALIDATE ; WRITE PATTERN INTO GROUP 0
D R[9] ; GENERATE PATTERN OF FLOATING 0 IN 1'S
LAB R[OB],ALU_D[ANDNOT]LB,D_ALU ; TO BE WRITTEN INTO LOCATION 4
RC[OD] D
VA K[.4]
FS/MCT,MCT/VALIDATE ; WRITE PATTERN INTO GROUP 0
D R[7]
VA D,RC[OA]_D ; SET UP THE VA FOR THE UNALIGNED REFERENCE
D R[6] ; SET DEFAULT OF D TO AAAAAAAA
LAB R[OE]
R[OF] LA ; SET UP UTRAP FLAG
FS/MCT,MCT/READ.V.WCHK ; TEST INSTRUCTION. SHOULD UTRAP
RC[OC] D ; SAVE DATA READ BY FIRST REFERENCE
D R[OF] ; SEE IF A UTRAP OCCURRED
R[OF] 0
Q RC[OE]
ALU Q-D,CLK.UBCC
Z?
=0 J/MDAL1C
ERROR1,RC[9]_D ; NO UTRAP.
MDAL1C: ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS BECAUSE OF UNALIGNED DATA.
Z?
=0 ERROR1,RC[9]_D ; UTRAPPED BUT NOT BECAUSE OF UNALIGNED DATA.
Q K[.4] ; COMPUTE EXPECTED RESULT
D R[7] ; RESULT OF THIS FIRST REFERENCE
ALU Q-D,D,ALU ; THE RESULT SHOULD BE A ROTATION OF
D D.LEFT,S1/ZERO ; THE DATA AT LOCATION 0.
D D.LEFT2,S1/ZERO
SC D,RC[5] D
Q RC[OE],D 0

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U 126B, 0D00,003C,0180,0800,0000,126C :2587      D DAL.SC
U 126C, 0001,003C,0180,09D8,0000,126D :2588      RC[OB] D
U 126D, 0010,0038,01C0,0960,0000,126E :2589      Q RC[OC]
U 126E, 001D,2000,0180,0800,0010,126F :2590      ALU_Q-D,CLK.UBCC      ; SEE IF THE ACTUAL RESULT WAS CORRECT.
U 126F, 0000,013C,0180,0800,0000,10A4 :2591      Z?
U 10A4, 0000,003D,0180,0800,0000,1138 :2592      ERROR1      ; THE DATA READ ON THE 1ST REFERENCE WAS INCORRECT
U 10A5, 0018,0038,0580,09C0,0000,1270 :2593      RC[8]_K[.1]      ; ERROR FLAG FOR SECOND REFERENCE
U 1270, 0800,003C,0180,0A3B,0000,1271 :2594      VA VA+4,D,R[7]      ; INCREMENT THE VA
U 1271, 0019,0014,1180,09D0,0000,1272 :2595      ALU_D+K[.4],RC[OA]_ALU
U 1272, 0810,0038,0180,0960,0000,1273 :2596      D RC[OC]
U 1273, 0000,003C,0180,0A70,0000,1274 :2597      LAB RC[OE]
U 1274, 0000,003C,0180,0AF8,0000,1275 :2598      RC[OF] LA      ; SET UP THE UTRAP FLAG
U 1275, 0000,003C,0180,5000,3000,1276 :2599      FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF      ; SHOULD NOT UTRAP
U 1276, 0001,003C,0180,09E0,0000,1277 :2600      RC[OC] D      ; SAVE THE RESULT OF THE 2ND REF.
U 1277, 0800,003C,0180,0A78,0000,1278 :2601      D RC[OF]      ; SEE IF A UTRAP OCCURRED
U 1278, 0003,003C,0180,0AF8,0000,1279 :2602      RC[OF] 0
U 1279, 0000,003C,01C0,0A70,0000,127A :2603      Q RC[OE]
U 127A, 001D,2000,0180,0800,0010,127B :2604      ALU_Q-D,CLK.UBCC
U 127B, 0000,013C,0180,0800,0000,10A6 :2605      Z?
U 10A6, 0001,003D,0180,09C8,0000,1138 :2606      ERROR1,RC[9]_D      ; UTRAPPED.
U 10A7, 0000,003C,0180,0A28,0082,127C :2607      SC RC[5]      ; COMPUTE THE RESULT
U 127C, 0810,0038,0180,0968,0000,127D :2608      D RC[OD]      ; OF THIS SECOND REFERENCE
U 127D, 0010,0038,01C0,0970,0000,127E :2609      Q RC[OE]
U 127E, 0D10,0038,01C0,0960,0000,127F :2610      D DAL.SC,Q_RC[OC]
U 127F, 0001,003C,0180,09D8,0000,1280 :2611      RC[OB] D
U 1280, 001D,2000,0180,0800,0010,1281 :2612      ALU_Q-D,CLK.UBCC      ; WAS THE RESULT CORRECT.
U 1281, 0000,013C,0180,0800,0000,10A8 :2613      Z?
U 10A8, 0000,003D,0180,0800,0000,1138 :2614      ERROR1      ; SECOND REFERENCE DATA INCORRECT.
U 10A9, 0800,003C,0180,0A50,0000,1282 :2615      D RC[OA]      ; SHIFT THE FLOATING 0 IN 1'S PATTERN
U 1282, 0000,003C,01C0,0A58,0000,1283 :2616      Q RC[OB]
U 1283, 0600,003C,0080,0800,0000,1284 :2617      D D.RIGHT,Q_Q.RIGHT,SI/ASHR
U 1284, 0001,003C,0180,0AD0,0000,1285 :2618      RC[OA] D
U 1285, 0001,203C,0180,0AD8,0000,1286 :2619      RC[OB] Q
U 1286, 0000,003C,0180,0A60,0010,1287 :2620      ALU_RC[OC],CLK.UBCC      ; SEE IF ALL PATTERNS HAVE BEEN TRIED
U 1287, 0000,013C,0180,0800,0000,10AA :2621      Z?
U 10AA, 0018,0000,0580,0AE0,0000,124E :2622      RC[OC]_LA-K[.1],J/MDAL1B      ; IF NOT CONTINUE
U 10AB, 0800,003C,7180,0A40,0084,7288 :2623      SC K[FFF8],D_RC[8]      ; IF ALL PATTERNS HAVE BEEN
U 1288, 001B,0000,05C0,0800,0000,1289 :2624      ALU_Q-K[.1],Q_ALU      ; TRIED WITH THAT ADDRESS
U 1289, 0D00,003C,0180,0800,0000,128A :2625      D DAL.SC      ; GET READY TO DECREMENT THE ADDRESS
U 128A, 0001,003C,0180,0AC0,0000,128B :2626      R[8] D
U 128B, 0800,003C,01F8,0A48,0000,128C :2627      D RC[9],Q_0
U 128C, 0D00,003C,0180,0800,0000,128D :2628      D DAL.SC
U 128D, 0001,003C,0180,0AC8,0000,128E :2629      R[9] D
U 128E, 0000,003C,0180,0A38,0000,128F :2630      LAB R[7]
U 128F, 0018,0000,0580,0AB8,0010,1290 :2631      R[7]_LA-K[.1],CLK.UBCC      ; HAS EACH ADDRESS 3, 2 AND 1 BEEN TESTED?
U 1290, 0000,013C,0180,0800,0000,10AC :2632      Z?
U 10AC, 0000,003C,0180,0800,0000,1248 :2633      J/MDAL1A      ; IF NOT CONTINUE
U 10AD, 0000,003C,0180,0800,0000,10AE :2634      NOP

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U 10AE, 0000,003D,0180,0800,0000,1124
U 10AF, 0F03,003C,0180,0AF8,0000,1080
U 10B0, 0000,003D,4980,3C00,0000,1183
U 10B1, 0018,0038,5D80,09F8,0000,1082
U 10B2, 0F00,003D,0180,0800,0000,1161
U 10B3, 0001,003C,0180,0AB0,0000,1291
U 1291, 0018,0038,4980,0AC8,0000,1292
U 1292, 0B1B,0000,05F8,0800,0000,1293

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.PAGE "TEST E8 MDAL TEST 2"
*****
++
TEST E8 MDAL TEST 2

TEST DESCRIPTION
THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING
DT=WORD AND VA<01:00>=11. THIS CONDITION IS TRIED AS
A FIRST REFERENCE (WHICH SHOULD UTRAP) AND AS A SECOND
REFERENCE.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.

ERROR DESCRIPTION
DATA AT LOCATION 0
DATA AT LOCATION 4
DATA READ
EXPECTED DATA READ
ADDRESS READ
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
-----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

ERROR FLAG: (FOR FAILCHAIN)
0=> ERROR ON FIRST REFERENCE
1=> ERROR ON SECOND REFERENCE

--
*****
=0
MDAL2: NEWTST
D 0,R[0F]_0
ID[1BER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
RC[0F] K[7]
=0
D 0,CALL,J/DCLA ; GENERATE SOME CONSTANTS
R[6] D ; R[6]=AAAAAAA
R[9] K[FF] ; R[9]=000000FF
ALU_0-K[1],D_ALU.Q_0
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U 1293, 0000,003C,7D80,0800,0084,7294 :2690 SC K[.18]
U 1294, 0000,003C,0180,0800,0000,1295 :2691 D DAL.SC
U 1295, 0001,003C,0180,0AC0,0000,1084 :2692 R[8] D ; R[8]=FF000000
U 1084, 0F00,003D,0180,0800,0000,1141 :2693 =0 D 0,CALL,J/DC.1DE ; SET UP THE UTRAP FLAG
U 1085, 0001,003C,0180,0AF0,0000,1296 :2694 R[OE] D
U 1296, 0F18,0038,1980,0800,0200,1297 :2695 VA K[ZERO],D 0 ; INVALIDATE LOCATION 0
U 1297, 0000,003C,0180,9000,0000,1298 :2696 FS7MCT,MCT/INVALIDATE ; IN BOTH GROUPS
U 1298, 0000,003C,0180,0803,0000,1299 :2697 VA VA+4 ; INVALIDATE LOCATION 4
U 1299, 0000,003C,0180,9000,0000,129A :2698 FS7MCT,MCT/INVALIDATE ; IN BOTH GROUPS
U 129A, 0018,0038,4180,0AD8,0000,129B :2699 R[OB]_K[.80] ; INITIALIZE FLOATING PATTERN
U 129B, 0003,003C,0180,0AD0,0000,129C :2700 R[OA]_0
U 129C, 0018,0038,6180,0AE0,0000,1086 :2701 R[OC]_K[.F] ; SET UP A COUNTER FOR THE PATTERN
U 1086, 0000,003D,0180,0800,0000,1137 :2702 =0 ERLOOP
U 1087, 0003,003C,0180,09C0,0000,129D :2703 MDAL2A: D R[8] ; ERROR CODE => FIRST REFERENCE
U 129D, 0800,003C,0180,0A40,0000,129E :2704 LAB R[OA],ALU_D[ANDNOT]LB,D ALU ; PATTERN TO
U 129E, 080D,0024,0180,0A50,0000,129F :2705 R[OE] D ; BE WRITTEN AT LOCATION 0
U 129F, 0001,003C,0180,09F0,0000,1088 :2706 =0 VA K[ZERO],CALL,J/ROS ; SET THE FORCE REPLACE GROUP 0 BIT
U 1088, 0018,0039,1980,0800,0200,1187 :2707 D R[OE]
U 1089, 0810,0038,0180,0970,0000,12A0 :2708 FS/MCT,MCT/VALIDATE ; WRITE PATTERN AT 0
U 12A0, 0000,003C,0180,9800,0000,12A1 :2709 D R[9] ; GENERATE THE SECOND
U 12A1, 0800,003C,0180,0A48,0000,12A2 :2710 LAB R[OB],ALU_D[ANDNOT]LB,D ALU ; HALF OF THE FLOATING
U 12A2, 080D,0024,0180,0A58,0000,12A3 :2711 R[OD] D ; PATTERN TO BE WRITTEN
U 12A3, 0001,003C,0180,09E8,0000,12A4 :2712 VA K[.4] ; AT LOCATION 4
U 12A4, 0018,0038,1180,0800,0200,12A5 :2713 FS7MCT,MCT/VALIDATE ; WRITE PATTERN INTO GROUP 0
U 12A5, 0000,003C,0180,9800,0000,12A6 :2714 VA K[.3],R[OA]_K[.3] ; SET UP VA=3
U 12A6, 0018,0038,0D80,09D0,0200,12A7 :2715 D R[6] ; PUT DEFAULT PATTERN INTO D=AAAAAAAA
U 12A7, 0800,003C,0180,0A30,0000,12A8 :2716 LAB R[OE]
U 12A8, 0000,003C,0180,0A70,0000,12A9 :2717 R[OF] LA ; SET UP UTRAP FLAG
U 12A9, 0000,003C,0180,0AF8,0000,12AB :2718 DT/WORD,FS/MCT,MCT/READ.V.WCHK ; SHOULD UTRAP
U 12AB, 0000,403C,0180,5000,0000,12AC :2719 R[OC] D ; SAVE THE DATA READ
U 12AC, 0001,003C,0180,09E0,0000,12AD :2720 D R[OF] ; SEE IF A UTRAP OCCURRED
U 12AD, 0800,003C,0180,0A78,0000,12AE :2721 R[OF] 0
U 12AE, 0003,003C,0180,0AF8,0000,12AF :2722 Q R[OE]
U 12AF, 0000,003C,01C0,0A70,0000,12B0 :2723 A[U_Q-D,CLK.UBCC
U 12B0, 001D,2000,0180,0800,0010,12B1 :2724 Z?
U 12B1, 0000,013C,0180,0800,0000,108A :2725 =0 J/MDAL2B
U 108A, 0000,003C,0180,0800,0000,12B2 :2726 ERROR1,R[9]_D ; DIDN'T UTRAP
U 108B, 0001,003D,0180,09C8,0000,1138 :2727 MDAL2B: ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS
U 12B2, 0019,0034,0980,0800,0010,12B3 :2728 Z? ; BECAUSE OF UNALIGNED DATA
U 12B3, 0000,013C,0180,0800,0000,108C :2729 =0 ERROR1,R[9]_D ; UTRAP NOT ALIGN ERROR.
U 108C, 0001,003D,0180,09C8,0000,1138 :2730 SC K[.8],D_0 ; COMPUTE EXPECTED
U 108D, 0F00,003C,0180,0800,0084,72B4 :2731 Q R[OE] ; RESULT OF THE 1ST READ
U 12B4, 0010,0038,01C0,0970,0000,12B5 :2732 D DAL.SC,Q_R[OC]
U 12B5, 0D10,0038,01C0,0960,0000,12B6 :2733 R[OB] D
U 12B6, 0001,003C,0180,09D8,0000,12B7 :2734 ALU_Q-D,CLK.UBCC ; WAS RESULT CORRECT?
U 12B7, 001D,2000,0180,0800,0010,12B8 :2735 Z?
U 12B8, 0000,013C,0180,0800,0000,108E :2736 =0 ERROR1 ; DATA ERROR ON FIRST READ
U 108E, 0000,003D,0180,0800,0000,1138 :2737 VA K[.7],R[OA]_K[.7] ; SET UP VA FOR SEOND REF. =7
U 108F, 0018,0038,5D80,09D0,0200,12B9 :2738 D R[OC]
U 12B9, 0810,0038,0180,0960,0000,12BA :2739 LAB R[OE]
U 12BA, 0000,003C,0180,0A70,0000,12BB :2740 R[OF] LA ; SET UP UTRAP FLAG
U 12BB, 0000,003C,0180,0AF8,0000,12BC :2741 DT/WORD,FS/MCT,MCT/READ.V.WCHK,MSR/SECOND.REF ; SHOULD NOT UTRAP
U 12BC, 0000,403C,0180,5000,3000,12BD :2742 R[OC] D ; SAVE THE RESULT
U 12BD, 0001,003C,0180,09E0,0000,12BE :2743 D_R[OF] ; SEE IF A UTRAP OCCURRED
U 12BE, 0800,003C,0180,0A78,0000,12BF :2744
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U 12BF, 0003,003C,0180,0AF8,0000,12C0 :2745
U 12C0, 0000,003C,01C0,0A70,0000,12C1 :2746
U 12C1, 001D,2000,0180,0800,0010,12C2 :2747
U 12C2, 0018,0138,0580,09C0,0000,10C0 :2748
U 10C0, 0001,003D,0180,09C8,0000,1138 :2749
U 10C1, 0000,003C,0180,0800,0084,72C3 :2750
U 12C3, 0810,0038,0180,0968,0000,12C4 :2751
U 12C4, 0010,0038,01C0,0970,0000,12C5 :2752
U 12C5, 0D10,0038,01C0,0960,0000,12C6 :2753
U 12C6, 0001,003C,0180,09D8,0000,12C7 :2754
U 12C7, 001D,2000,0180,0800,0010,12C8 :2755
U 12C8, 0000,013C,0180,0800,0000,10C2 :2756
U 10C2, 0000,003D,0180,0800,0000,1138 :2757
U 10C3, 0800,003C,0180,0A50,0000,12C9 :2758
U 12C9, 0000,003C,01C0,0A58,0000,12CA :2759
U 12CA, 0600,003C,00B0,0800,0000,12CB :2760
U 12CB, 0001,203C,0180,0AD0,0000,12CC :2761
U 12CC, 0001,003C,0180,0AD8,0000,12CD :2762
U 12CD, 0000,003C,0180,0A60,0010,12CE :2763
U 12CE, 0000,013C,0180,0800,0000,10C4 :2764
U 10C4, 0018,0000,0580,0AE0,0000,129D :2765
U 10C5, 0000,003C,0180,0800,0000,10C6 :2766

```

=0

=0

=0

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R[0F] 0
Q R[0E]
ALU Q-D,CLK,UBCC
Z?,R[8],K[1]
ERROR1,R[9],D
SC K[8]
D_R[0D]
Q_R[0E]
D-DAL,SC,Q_R[0C]
R[0B] D
ALU Q-D,CLK,UBCC
Z?
ERROR1
D_R[0A]
Q_R[0B]
D-D.RIGHT,Q-Q.RIGHT,SI/ASHR
R[0A] Q
R[0B] D
ALU_R[0C],CLK,UBCC
Z?
R[0C]_LA-K[1],J/MDAL2A
NOP

```

```

; ERROR CODE => SECOND REFERENCE
; UTRAPPED
; COMPUTE EXPECTED RESULT OF THIS
; SECOND REFERENCE

; WAS DATA READ CORRECT?

; RESULT INCORRECT
; COMPUTE NEXT TEST PATTERN

; SEE IF ALL PATTERNS HAVE BEEN TRIED.
; IF NOT CONTINUE

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U 10C6, 0000,003D,0180,0800,0000,1124
U 10C7, 0F03,003C,0180,0AF8,0000,10C8
U 10C8, 0000,003D,4980,3C00,0000,1183
U 10C9, 0018,0038,D580,09F8,0000,10CA
U 10CA, 0F00,003D,0180,0800,0000,1161
U 10CB, 0001,003C,0180,0AB0,0000,12CF
U 12CF, 001B,001C,C180,0AC0,0000,12D0
U 12D0, 0003,003C,0180,0AC8,0000,12D1
U 12D1, 0018,0038,0980,0AB8,0000,10CC
U 10CC, 0F00,003D,0180,0800,0000,1141
U 10CD, 0001,003C,0180,0AF0,0000,12D2
U 12D2, 0F18,0038,1980,0800,0200,12D3
U 12D3, 0000,003C,0180,9000,0000,12D4

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.PAGE "TEST E9 MDAL TEST 3"
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++
TEST E9 MDAL TEST 3

TEST DESCRIPTION
THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING DT=WORD
AND VA<01:00>= 10, 01 AND 00.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.

ERROR DESCRIPTION
DATA AT LOCATION 0
DATA AT LOCATION 4
DATA READ
EXPECTED DATA READ
ADDRESS READ
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
-----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP
--
*****
=0
MDAL3: NEWTST
D 0,R[0F]_0
=0 ID[0BER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
RC[0F]_K[6]
=0 D 0,CALL,J/DCLA ; GENERATE SOME CONSTANTS
R[6]_D ; R[6]=AAAAAAA
ALU NOT.K[FFFF],R[8]_ALU ; R[8]=FFFF0000
R[9]_0 ; R[9]=00000000
R[7]_K[2] ; ADDRESS USED
=0 D 0,CALL,J/DC.1DE ; CONSTANT USED AS UTRAP FLAG
R[0E]_D
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0
FS7MCT,MCT/INVALIDATE ; IN BOTH GROUPS

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VA VA+4 ; INVALIDATE LOCATION 4
FS/MCT,MCT/INVALIDATE ; IN BOTH GROUPS
MDAL3A: D R[7] ; INITIALIZE THE FLOATING
D_D.LEFT2,SI/ZERO ; 0 IN 1'S PATTERN
D_D.LEFT,SI/ZERO,Q_K[F],R[OB]_K[F]
ALU D+Q,R[OA]_ALU
=0 ERLOOP
MDAL3B: SC R[OA] ; GENERATE THE FLOATING PATTERN
D R[8] ; TO BE WRITTEN INTO LOCATION 0
ALU D.AND.MASK,R[OE]_ALU
=0 VA R[ZERO],CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D R[OE]
FS/MCT,MCT/VALIDATE ; WRITE LOCATION 0 OF GROUP 0
R[OD] 0,D 0,VA VA+4 ; WRITE DATA=00000000 INTO
FS/MCT,MCT7VALIDATE ; LOCATION 4 OF GROUP 0
D R[7]
VA D,R[OA]_D ; LOAD ADDRESS INTO VA FOR TEST REF.
D R[6] ; SET UP DEFAULT PATTERN IN D
LAB R[OE]
R[OF] LA ; SET UP UTRAP FLAG
DT/WORD,FS/MCT,MCT/READ.V.WCHK ; TEST INSTRUCTION, SHOULD NOT UTRAP
R[OC] D ; SAVE DATA READ
D R[OF] ; SEE IF A UTRAP OCCURRED
R[OF] 0
Q R[OE]
ALU Q-D,CLK.UBCC
Z?
=0 ERROR1,R[9]_D ; UTRAP OCCURRED.
SC R[OB] ; COMPUTE EXPECTED RESULT
D R[FFFF]
ALU D.AND.MASK,R[OB]_ALU,D_ALU
Q R[OC]
ALU Q-D,CLK.UBCC
Z?
=0 ERROR1 ; DATA READ IS INCORRECT
D R[OA] ; COMPUTE NEXT TEST PATTERN
ALU D-K[.1],R[OA]_ALU
ALU_R[OB],CLK.UBCC ; TRIED ALL PATTERNS?
Z?
=0 R[OB]_LA-K[.1],J/MDAL3B ; IF NOT CONTINUE.
SC K[FFFF8],Q_0 ; IF ALL PATTERNS HAVE BEEN TRIED
D R[8] ; AT THIS ADDRESS GO TO NEXT ADDRESS
D_DAL.SC
R[8] D
ALU_R[7],CLK.UBCC ; HAS EACH OF THE ADDRESSES
Z? ; 2, 1 AND 0 BEEN TESTED
=0 R[7]_LA-K[.1],J/MDAL3A ; IF NOT CONTINUE
NOP

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U 10DA, 0000,003D,0180,0800,0000,1124
U 10DB, 0F03,003C,0180,0AF8,0000,10DC
U 10DC, 0000,003D,4980,3C00,0000,1183
U 10DD, 0018,0038,D580,09F8,0000,10DE
U 10DE, 0F00,003D,0180,0800,0000,1161
U 10DF, 0001,003C,0180,0AB0,0000,12F8
U 12F8, 0000,003C,7D80,0800,0084,72F9
U 12F9, 0003,0010,0180,0AC0,0000,12FA
U 12FA, 0018,0038,0D80,0AB8,0000,10E0
U 10E0, 0F00,003D,0180,0800,0000,1141
U 10E1, 0001,003C,0180,0AF0,0000,12FB
U 12FB, 0F18,0038,1980,0800,0200,12FC
U 12FC, 0000,003C,0180,9000,0000,12FD

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.PAGE "TEST EA MDAL TEST 4"
*****
++
TEST EA MDAL TEST 4

TEST DESCRIPTION
THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING
DT=BYTE AND VA<01:00>= 11, 10, 01 AND 00.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.

ERROR DESCRIPTION
DATA AT LOCATION 0
DATA AT LOCATION 4
DATA READ
EXPECTED DATA READ
ADDRESS READ
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
-----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP
-----
--
*****
=0
MDAL4: NEWTST
D 0,R[0F],0
ID[1BER0],D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
RC[0F],K[6]
=0 D 0,CALL,J/DCLA ; GENERATE SOME CONSTANTS
R[6],D ; R[6]=AAAAAAA
SC K[18]
ALD MASK+1,R[8],ALU ; R[8]=FF000000
R[7],K[3] ; ADDRESS USED IN TEST
=0 D 0,CALL,J/DC.1DE ; GET CONSTANT USED AS THE UTRAP FLAG
R[0E],D
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0
FS7MCT,MCT/INVALIDATE ; IN BOTH GROUPS

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U 12FD, 0000,003C,0180,0803,0000,12FE :2925
U 12FE, 0000,003C,0180,9000,0000,12FF :2926
U 12FF, 0800,003C,0180,0A38,0000,1300 :2927
U 1300, 0100,003C,0180,0800,0000,1301 :2928
U 1301, 0518,0038,5DC0,0AD8,0000,1302 :2929
U 1302, 001D,0014,0180,0AD0,0000,10E2 :2930
U 10E2, 0000,003D,0180,0800,0000,1137 :2931
U 10E3, 0000,003C,0180,0A50,0082,1303 :2932
U 1303, 0800,003C,0180,0A40,0000,1304 :2933
U 1304, 0001,0034,0180,09F0,0000,10E4 :2934
U 10E4, 0018,0039,1980,0800,0200,1187 :2935
U 10E5, 0810,0038,0180,0970,0000,1305 :2936
U 1305, 0000,003C,0180,9800,0000,1306 :2937
U 1306, 0F03,003C,0180,09EB,0000,1307 :2938
U 1307, 0000,003C,0180,9800,0000,1308 :2939
U 1308, 0800,003C,0180,0A38,0000,1309 :2940
U 1309, 0001,003C,0180,09D0,0200,130A :2941
U 130A, 0800,003C,0180,0A30,0000,130B :2942
U 130B, 0000,003C,0180,0A70,0000,130C :2943
U 130C, 0000,003C,0180,0AF8,0000,130D :2944
U 130D, 0000,803C,0180,5000,0000,130E :2945
U 130E, 0001,003C,0180,09E0,0000,130F :2946
U 130F, 0800,003C,0180,0A78,0000,1310 :2947
U 1310, 0003,003C,0180,0AF8,0000,1311 :2948
U 1311, 0000,003C,01C0,0A70,0000,1312 :2949
U 1312, 001D,2000,0180,0800,0010,1313 :2950
U 1313, 0000,013C,0180,0800,0000,10E6 :2951
U 10E6, 0001,003D,0180,09C8,0000,1138 :2952
U 10E7, 0000,003C,0180,0A58,0082,1314 :2953
U 1314, 0818,0038,4980,0800,0000,1315 :2954
U 1315, 0801,0034,0180,09D8,0000,1316 :2955
U 1316, 0010,0038,01C0,0960,0000,1317 :2956
U 1317, 001D,2000,0180,0800,0010,1318 :2957
U 1318, 0000,013C,0180,0800,0000,10E8 :2958
U 10E8, 0000,003D,0180,0800,0000,1138 :2959
U 10E9, 0800,003C,0180,0A50,0000,1319 :2960
U 1319, 0019,0000,0580,0AD0,0000,131A :2961
U 131A, 0000,003C,0180,0A58,0010,131B :2962
U 131B, 0000,013C,0180,0800,0000,10EA :2963
U 10EA, 0018,0000,0580,0AD8,0000,10E3 :2964
U 10EB, 0000,003C,71F8,0800,0084,731C :2965
U 131C, 0800,003C,0180,0A40,0000,131D :2966
U 131D, 0D00,003C,0180,0800,0000,131E :2967
U 131E, 0001,003C,0180,0AC0,0000,131F :2968
U 131F, 0000,003C,0180,0A38,0010,1320 :2969
U 1320, 0000,013C,0180,0800,0000,10EC :2970
U 10EC, 0018,0000,0580,0AB8,0000,12FF :2971
U 10ED, 0000,003C,0180,0800,0000,10EE :2972

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MDAL4A: VA VA+4 ; INVALIDATE LOACTION 4
FS/MCT,MCT/INVALIDATE ; IN BOTH GROUPS
D R[7] ; INITIALIZE THE FLOATING
D-D.LEFT2,SI/ZERO ; 0 IN 1'S PATTERN
D-D.LEFT,SI/ZERO,Q_K[.7],R[OB]_K[.7]
ALU D+Q,R[OA]_ALU
=0 ERL00P
MDAL4B: SC R[OA] ; GENERATE THE DATA PATTERN
D R[8] ; WRITTEN INTO LOCATION 0
ALU D.AND.MASK,R[OE]_ALU
=0 VA R[ZERO],CALL,J/ROS ; SET THE FORCE REPLACE GROUP 0 BIT
D R[OE]
FS/MCT,MCT/VALIDATE ; WRITE LOCATION 0 OF GROUP 0
R[OD] 0,D 0,VA VA+4 ; WRITE DATA=00000000 INTO
FS/MCT,MCT7VALIDATE ; LOCATION 4 OF GROUP 0
D R[7] ; GET TEST ADDRESS
VA D,R[OA]_D
D R[6] ; SET DEFAULT VALUE OF D
LAB R[OE]
R[OF] LA ; SET UP UTRAP FLAG
DT/BYTE,FS/MCT,MCT/READ.V.WCHK ; TEST INSTRUCTION, SHOULD NOT UTRAP
R[OC] D ; SAVE READ DATA
D R[OF] ; SEE IF A UTRAP OCCURRED
R[OF] 0
Q R[OE]
ALU Q-D,CLK.UBCC
Z?
=0 ERROR1,R[9]_D ; UTRAPPED
SC R[OB] ; COMPUTE EXPECTED RESULT.
D R[.FF]
ALU D.AND.MASK,R[OB]_ALU,D_ALU
Q R[OC]
ALU Q-D,CLK.UBCC ; CHECK RESULT
Z?
=0 ERROR1 ; DATA READ INCORRECT
D R[OA] ; COMPUTE NEXT DATA PATTERN
ALU D-K[.1],R[OA]_ALU
ALU R[OB],CLK.UBCC ; TRIED ALL PATTERNS?
Z?
=0 R[OB]_LA-K[.1],J/MDAL4B ; IF NOT CONTINUE
SC K[.FFF8],Q_0 ; SET UP TO TEST NEXT ADDRESS
D R[8]
D-DAL.SC
R[8] D
ALU R[7],CLK.UBCC ; TESTED ALL ADDRESSES?
Z?
=0 R[7]_LA-K[.1],J/MDAL4A ; IF NOT CONTINUE.
NOP

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U 10EE, 0000,003D,0180,0800,0000,1124
U 10EF, 0F03,003C,0180,0AF8,0000,10F0
U 10F0, 0000,003D,4980,3C00,0000,1183
U 10F1, 0018,0038,5D80,09F8,0000,1321
U 1321, 0018,0038,0980,0AB8,0000,10F2
U 10F2, 0F00,003D,0180,0800,0000,1141
U 10F3, 0001,003C,0180,0AF0,0000,1322
U 1322, 0F18,0038,1980,0800,0200,1323
U 1323, 0000,003C,0180,9000,0000,1324

.PAGE "TEST EB BAL TEST 1"

++
TEST EB BAL TEST 1
TEST DESCRIPTION
THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
GENERATER USING DT=LONG AND VA<01:00>= 11, 10 AND 01. EACH
CONDITION IS TRIED AS A FIRST REFERENCE (WHICH SHOULD
RESULT IN AN UNALIGNED DATA UTRAP) AND THEN AS A
SECOND REFERENCE.
LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE BYTE ALIGNER IS ON DBP.
ERROR DESCRIPTION
EXPECTED DATA AT LOCATION 0
EXPECTED DATA AT LOCATION 4
GOT DATA AT LOCATION 0
GOT DATA AT LOCATION 4
ADDRESS WRITTEN
DATA WRITTEN
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE

1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP
--

=0
BAL1: NEWTST
D 0,R[0F] 0
ID[1BER0] D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
=0 R[0F] K[7]
R[7] K[2] ; SET UP A COUNTER FOR THE ADDRESS USED
D 0,CALL,J/DC.1DE ; GET CONSTANT USED AS UTRAP FLAG
=0 R[0E] D
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0
FS7MCT,MCT/INVALIDATE ; IN BOTH GROUPS

U 1324.	0000,003C,0180,0803,0000,1325	:3028
U 1325.	0000,003C,0180,9000,0000,1326	:3029
U 1326.	0800,003C,0180,0A38,0000,1327	:3030
U 1327.	0819,0014,0580,09D0,0000,1328	:3031
U 1328.	0100,003C,0180,0800,0000,1329	:3032
U 1329.	0500,003C,0180,0800,0000,132A	:3033
U 132A.	0001,003C,0180,0A98,0000,132B	:3034
U 132B.	0018,0038,8D80,0AA0,0000,10F4	:3035
U 10F4.	0000,003D,0180,0800,0000,1137	:3036
U 10F5.	0000,003C,0180,0A20,0082,132C	:3037
U 132C.	0000,0038,01C0,09C8,0000,132D	:3038
U 132D.	0F00,003C,0180,0A18,0082,132E	:3039
U 132E.	0D00,003C,0180,0800,0000,132F	:3040
U 132F.	0001,003C,0180,09E8,0000,1330	:3041
U 1330.	0C00,003C,01F8,0800,0000,1331	:3042
U 1331.	0D00,003C,0180,0800,0000,1332	:3043
U 1332.	0001,003C,0180,09F0,0000,10F6	:3044
U 10F6.	0000,003D,0180,0800,0000,1187	:3045
U 10F7.	0F18,0038,1980,0800,0200,1333	:3046
U 1333.	0000,003C,0180,9800,0000,1334	:3047
U 1334.	0F00,003C,0180,0803,0000,1335	:3048
U 1335.	0000,003C,0180,9800,0000,10F8	:3049
U 10F8.	0000,003D,0180,0800,0000,1183	:3050
U 10F9.	0010,0038,0180,0950,0200,1336	:3051
U 1336.	0810,0038,0180,0948,0000,1337	:3052
U 1337.	0000,003C,0180,0A70,0000,1338	:3053
U 1338.	0000,003C,0180,0AF8,0000,1339	:3054
U 1339.	0000,003C,0180,3000,0000,133A	:3055
U 133A.	0800,003C,0180,0A78,0C00,133B	:3056
U 133B.	0003,003C,0180,0AF8,0000,133C	:3057
U 133C.	0000,003C,01C0,0A70,0000,133D	:3058
U 133D.	001D,2000,0180,0800,0010,133E	:3059
U 133E.	0000,013C,0180,0800,0000,10FA	:3060
U 10FA.	0000,003C,0180,0800,0000,133F	:3061
U 10FB.	0001,003D,0180,09C0,0000,1138	:3062
U 133F.	0019,0034,0980,0800,0010,1340	:3063
U 1340.	0000,013C,0180,0800,0000,10FC	:3064
U 10FC.	0001,003D,0180,09C0,0000,1138	:3065
U 10FD.	0000,003C,0180,0803,0000,1341	:3066
U 1341.	0810,0038,0180,0948,0000,1342	:3067
U 1342.	0000,003C,0180,0A70,0000,1343	:3068
U 1343.	0000,003C,0180,0AF8,0000,1344	:3069
U 1344.	0000,003C,0180,3000,3000,1345	:3070
U 1345.	0800,003C,0180,0A78,0000,1346	:3071
U 1346.	0003,003C,0180,0AF8,0000,1347	:3072
U 1347.	0000,003C,01C0,0A70,0000,1348	:3073
U 1348.	001D,2000,0180,0800,0010,1349	:3074
U 1349.	0000,013C,0180,0800,0000,10FE	:3075
U 10FE.	0001,003D,0180,09C0,0000,1138	:3076
U 10FF.	0018,0038,1980,0800,0200,134A	:3077
U 134A.	0000,003C,0180,0A70,0000,134B	:3078
U 134B.	0000,003C,0180,0AF8,0000,134C	:3079
U 134C.	0000,003C,0180,5000,0000,134D	:3080
U 134D.	0001,003C,0180,09E0,0000,134E	:3081

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VA VA+4 ; INVALIDATE LOCATION 4 IN BOTH GROUPS
FS7MCT,MCT/INVALIDATE
BAL1A: D R[7] ; COMPUTE CURRENT ADDRESS
ALU D+K[.1],D,ALU,RC[0A] ALU ; BEING TESTED
D D.LEFT2,SI/ZERO ; INITIALIZE THE FLOATING DATA PATTERN
D D.LEFT,SI/ZERO
R[3] D
R[4] K[.1F] ; SET UP A COUNTER FOR THE DATA PATTERNS
=0 ERLOOP
BAL1B: SC R[4] ; COMPUTE THE FLOATING DATA PATTERN
ALD MASK,RC[9],ALU,Q,ALU ; AND EXPECTED RESULTS
SC R[3],D_0
D DAL,SC
R[0D] D
D Q,Q_0
D DAL,SC
R[0E] D
=0 CALL,J7ROS ; SET THE FORCE REPLACE GROUP 0 BIT
VA K[ZERO],D_0 ; WRITE DATA: 00000000 INTO
FS7MCT,MCT/VALIDATE ; GROUP 0
VA VA+4,D_0 ; WRITE DAT=00000000 INTO
FS7MCT,MCT/VALIDATE ; GROUP 0 LOCATION 4
=0 CALL,J/SOFF ; CLEAR FORCE REPLACE BITS
VA RC[0A] ; GET TEST ADDRESS
D RC[9] ; PUT TEST DATA PATTERN INTO D
LAB R[0E]
R[0F] LA ; SET UP THE UTRAP FLAG
FS/MCT,MCT/WRITE.V.WCHK ; TEST INSTRUCTION SHOULD UTRAP
D R[0F] ; SEE IF UTRAP OCCURRED
R[0F] 0
Q R[0E]
ALU,Q-D,CLK.UBCC
Z?
=0 J/BAL1C
ERROR1,RC[8]_D ; NO UTRAP OCCURRED
BAL1C: ALU,D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS BECAUSE
Z? ; OF AN ALIGNMENT ERROR
=0 ERROR1,RC[8]_D ; UTRAP NOT BECAUSE OF ALIGN
VA VA+4 ; INCREMENT THE VA TO 4
; TO DO THE SECOND REFERENCE
D RC[9] ; SET UP THE TEST DATA PATTERN IN D
LAB R[0E]
R[0F] LA ; SET THE UTRAP FLAG
FS/MCT,MCT/WRITE.V.WCHK,MSB/SECOND.REF ; TEST INSTRUCTION
D R[0F] ; SEE IF A UTRAP OCCURRED
R[0F] 0
Q R[0E]
ALU,Q-D,CLK.UBCC
Z?
=0 ERROR1,RC[8]_D ; UTRAPPED
VA K[ZERO] ; READ LOCATION 0 TO GET
LAB R[0E] ; THE FIRST HALF OF THE RESULT
R[0F] LA ; SET THE UTRAP FLAG
FS/MCT,MCT/READ.V.WCHK ; GET LOCATION 0 FROM GROUP 0
R[0C] D ; SAVE THE RESULT

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U 134E.	0800,003C,0180,0A78,0000,134F	:3083	D R[OF]	: SEE IF A UTRAP OCCURRED
U 134F.	0003,003C,0180,0AF8,0000,1350	:3084	R[OF] 0	
U 1350.	0000,003C,01C0,0A70,0000,1351	:3085	Q R[OE]	
U 1351.	001D,2000,0180,0800,0010,1352	:3086	A[U_Q-D,CLK.UBCC	
U 1352.	0000,013C,0180,0800,0000,110A	:3087	Z?	
U 110A.	0001,003D,0180,09C0,0000,1138	:3088	ERROR1,RC[8]_D	: UTRAPPED
U 110B.	0018,0038,1180,0800,0200,1353	:3089	VA K[.4]	: GET LOCATION 4, WHICH
U 1353.	0000,003C,0180,0A70,0000,1354	:3090	LAB R[OE]	: CONTAINS THE SECOND HALF OF THE RESULT
U 1354.	0000,003C,0180,0AF8,0000,1355	:3091	R[OF] LA	: SET UP THE UTRAP FLAG
U 1355.	0000,003C,0180,5000,0000,1356	:3092	FS/MCT,MCT/READ.V.WCHK	: READ LOCATION 4 OF GROUP 0
U 1356.	0001,003C,0180,09D8,0000,1357	:3093	RC[OB] D	: SAVE THE DATA READ
U 1357.	0800,003C,0180,0A78,0000,1358	:3094	D R[OF]	: SEE IF A UTRAP OCCURRED
U 1358.	0003,003C,0180,0AF8,0000,1359	:3095	R[OF] 0	
U 1359.	0000,003C,01C0,0A70,0000,135A	:3096	Q R[OE]	
U 135A.	001D,2000,0180,0800,0010,135B	:3097	A[U_Q-D,CLK.UBCC	
U 135B.	0000,013C,0180,0800,0000,1110	:3098	Z?	
U 1110.	0001,003D,0180,09C0,0000,1138	:3099	ERROR1,RC[8]_D	: UTRAPPED
U 1111.	0010,0038,01C0,0970,0000,135C	:3100	Q_RC[OE]	: CHECK THE DATA AT LOCATION 0
U 135C.	0810,0038,0180,0960,0000,135D	:3101	D-RC[OC]	
U 135D.	001D,2000,0180,0800,0010,135E	:3102	A[U_Q-D,CLK.UBCC	
U 135E.	0000,013C,0180,0800,0000,1112	:3103	Z?	
U 1112.	0000,003D,0180,0800,0000,1138	:3104	ERROR1	: DATA AT LOCATION 0 INCORRECT.
U 1113.	0010,0038,01C0,0968,0000,135F	:3105	Q_RC[OD]	: CHECK THE DATA AT LOCATION 4
U 135F.	0810,0038,0180,0958,0000,1360	:3106	D-RC[OB]	
U 1360.	001D,2000,0180,0800,0010,1361	:3107	A[U_Q-D,CLK.UBCC	
U 1361.	0000,013C,0180,0800,0000,1114	:3108	Z?	
U 1114.	0000,003D,0180,0800,0000,1138	:3109	ERROR1	: DATA AT LOCATION 4 INCORRECT.
U 1115.	0000,003C,0180,0A20,0010,1362	:3110	ALU_R[4],CLK.UBCC	: SEE IF ALL DATA PATTERNS HAVE BEEN TESTED
U 1362.	0000,013C,0180,0800,0000,1116	:3111	Z?	
U 1116.	0018,0000,0580,0AA0,0000,10F5	:3112	R[4] LA-K[.1],J/BAL1B	: IF NOT CONTINUE WITH NEXT PATTERN
U 1117.	0000,003C,0180,0A38,0010,1363	:3113	ALU_R[7],CLK.UBCC	: SEE IF EACH OF THE ADDRESSES 3, 2 AND 1
U 1363.	0000,013C,0180,0800,0000,1118	:3114	Z?	: HAS BEEN TESTED.
U 1118.	0018,0000,0580,0AB8,0000,1326	:3115	R[7]_LA-K[.1],J/BAL1A	: IF NOT TEST NEXT ADDRESS
U 1119.	0000,003C,0180,0800,0000,111A	:3116	NOP	
		:3117	=0	
U 111A.	0000,003D,0180,0800,0000,1124	:3118	DUMMY1: NEWTST	

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - 0FFF	Unused							
U 1000	1871:	1838	1845=	1861=	2254=	2255=	2256=	2257=
U 1008	2267=	2268=	2269=	2270=	2409=	2410=	2411=	2412=
U 1010	2422=	2423=	2424=	2425=	1862=	1863=	1952=	1953=
U 1018	1954=	1955=	1980=	1981=	1983=	1984=	1986=	1987=
U 1020	1990=	1991=	1993=	1994=	1996=	1997=	2000=	2001=
U 1028	2004=	2005=	2022=	2023=	2025=	2026=	2035=	2036=
U 1030	2038=	2039=	2041=	2042=	2044=	2045=	2059=	2060=
U 1038	2067=	2068=	2081=	2082=	2129=	2130=	2132=	2133=
U 1040	2137=	2138=	2140=	2141=	2152=	2153=	2154=	2155=
U 1048	2156=	2157=	2211=	2212=	2213=	2214=	1902:	1839
U 1050	2217=	2218=	2222=	2223=	2225=	2226=	2230=	2231=
U 1058	2260=	2261=	1905:	1840	2264=	2265=	1908:	1841
U 1060	2273=	2274=	2276=	2277=	2280=	2281=	2286=	2287=
U 1068	2294=	2295=	2299=	2300=	2306=	2307=	2310=	2311=
U 1070	2315=	2316=	2366=	2367=	2368=	2369=	2372=	2373=
U 1078	2377=	2378=	2380=	2381=	2385=	2386=	2415=	2416=
U 1080	2419=	2420=	2428=	2429=	2431=	2432=	2435=	2436=
U 1088	2441=	2442=	2449=	2450=	2454=	2455=	2461=	2462=
U 1090	2465=	2466=	2470=	2471=	2524=	2525=	2526=	2527=
U 1098	2528=	2529=	2538=	2539=	2550=	2551=	2555=	2556=
U 10A0	2575=	2576=	2579=	2580=	2592=	2593=	2606=	2607=
U 10A8	2614=	2615=	2622=	2623=	2633=	2634=	2682=	2683=
U 10B0	2684=	2685=	2686=	2687=	2693=	2694=	2702=	2703=
U 10B8	2707=	2708=	2726=	2727=	2730=	2731=	2737=	2738=
U 10C0	2749=	2750=	2757=	2758=	2765=	2766=	2809=	2810=
U 10C8	2811=	2812=	2813=	2814=	2818=	2819=	2828=	2829=
U 10D0	2832=	2833=	2849=	2850=	2856=	2857=	2861=	2862=
U 10D8	2868=	2869=	2912=	2913=	2914=	2915=	2916=	2917=
U 10E0	2921=	2922=	2931=	2932=	2935=	2936=	2952=	2953=
U 10E8	2959=	2960=	2964=	2965=	2971=	2972=	3019=	3020=
U 10F0	3021=	3022=	3024=	3025=	3036=	3037=	3045=	3046=
U 10F8	3050=	3051=	3061=	3062=	3065=	3066=	3077=	3078=
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	1842	3088=	3089=	1834:	1835:	1836:	1837:
U 1110	3099=	3100=	3104=	3105=	3109=	3110=	3112=	3113=
U 1118	3115=	3116=	3118=	1843	1844	1864	1865	1866
U 1120	1867	1868	1869	1870	1880	1881	1882	1883
U 1128	1884	1885	1886	1887	1888	1889	1890	1891
U 1130	1892	1893	1894	1895	1896	1897	1898	1899
U 1138	1900	1901	1903	1904	1936	1937	1943	1944
U 1140	1945	1950	1951	1957	1958	1959	1960	1961
U 1148	1962	1963	1964	1965	1966	1967	1968	1969

;Location		0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0		2145	2146	2147	2148	2149	2150	2151	2158
U 11A8		2159	2160	2161	2162	2163	2164	2165	2166
U 11B0		2215	2216	2219	2220	2224	2227	2228	2229
U 11B8		2232	2233	2234	2235	2236	2237	2238	2239
U 11C0		2240	2241	2242	2243	2244	2245	2246	2247
U 11C8		2248	2249	2250	2251	2252	2253	2258	2259
U 11D0		2262	2263	2266	2271	2272	2275	2278	2279
U 11D8		2282	2283	2284	2285	2288	2289	2290	2291
U 11E0		2292	2293	2296	2297	2298	2301	2302	2303
U 11E8		2304	2305	2308	2309	2312	2313	2314	2317
U 11F0		2318	2319	2320	2321	2370	2371	2374	2375
U 11F8		2379	2382	2383	2384	2015:	2016:	2017:	2018:
U 1200		2387	2388	2389	2390	2391	2392	2393	2394
U 1208		2395	2396	2397	2398	2399	2400	2401	2402
U 1210		2403	2404	2405	2406	2407	2408	2413	2414
U 1218		2417	2418	2421	2426	2427	2430	2433	2434
U 1220		2437	2438	2439	2440	2443	2444	2445	2446
U 1228		2447	2448	2451	2452	2453	2456	2457	2458
U 1230		2459	2460	2463	2464	2467	2468	2469	2472
U 1238		2473	2474	2475	2476	2530	2531	2532	2533
U 1240		2534	2535	2536	2537	2540	2541	2542	2543
U 1248		2544	2545	2546	2547	2548	2549	2552	2553
U 1250		2554	2557	2558	2559	2560	2561	2562	2563
U 1258		2564	2565	2566	2567	2568	2569	2570	2571
U 1260		2572	2573	2574	2577	2578	2581	2582	2583
U 1268		2584	2585	2586	2587	2588	2589	2590	2591
U 1270		2594	2595	2596	2597	2598	2599	2600	2601
U 1278		2602	2603	2604	2605	2608	2609	2610	2611
U 1280		2612	2613	2616	2617	2618	2619	2620	2621
U 1288		2624	2625	2626	2627	2628	2629	2630	2631
U 1290		2632	2688	2689	2690	2691	2692	2695	2696
U 1298		2697	2698	2699	2700	2701	2704	2705	2706
U 12A0		2709	2710	2711	2712	2713	2714	2715	2716
U 12A8		2717	2718	1929:	2719	2720	2721	2722	2723
U 12B0		2724	2725	2728	2729	2732	2733	2734	2735
U 12B8		2736	2739	2740	2741	2742	2743	2744	2745
U 12C0		2746	2747	2748	2751	2752	2753	2754	2755
U 12C8		2756	2759	2760	2761	2762	2763	2764	2815
U 12D0		2816	2817	2820	2821	2822	2823	2824	2825
U 12D8		2826	2827	2830	2831	2834	2835	2836	2837
U 12E0		2838	2839	2840	2841	2842	2843	2844	2845
U 12E8		2846	2847	2848	2851	2852	2853	2854	2855
U 12F0		2858	2859	2860	2863	2864	2865	2866	2867
U 12F8		2918	2919	2920	2923	2924	2925	2926	2927
U 1300		2928	2929	2930	2933	2934	2937	2938	2939
U 1308		2940	2941	2942	2943	2944	2945	2946	2947
U 1310		2948	2949	2950	2951	2954	2955	2956	2957
U 1318		2958	2961	2962	2963	2966	2967	2968	2969
U 1320		2970	3023	3026	3027	3028	3029	3030	3031
U 1328		3032	3033	3034	3035	3038	3039	3040	3041
U 1330		3042	3043	3044	3047	3048	3049	3052	3053
U 1338		3054	3055	3056	3057	3058	3059	3060	3063
U 1340		3064	3068	3069	3070	3071	3072	3073	3074

MICRO2 1M(01) 16-DEC-82 11:49:58

ESKODEF	0
ESKOOAC	0
ESKAHMAC	0
ESKAH30	884

Used	884
Remaining	

```
Total microwords used in memory U: 884
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

CCCCCCCCCCCCCCCC

N 8

SEQ 0718
Page 8

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH30.MIC

```
Pass 1 warnings:    0    Pass 2 warnings:    0
Pass 1 errors:      0    Pass 2 errors:      0
```

22
ES[illegible]

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2167	TEST EC BAL TEST 2
: 2301	TEST ED BAL TEST 3
: 2423	TEST EE BAL TEST 4
: 2548	TEST EF BAL TEST 5

ZZ-ESKAH-V132
ESKAH31.MCR

Subroutines

MICRO2 1M(01)

16-DEC-82 11:54:18

C 9

SEQ 0720
Page

:1
:1804
:1805

.NOLIST
.LIST

22
ES

```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
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:1819
:1820
:1821
:1822
:1823
:1824
U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,104F
U 104F, 0C00,003C,01E0,0800,0000,105B
U 105B, 0000,003C,8180,3C00,0000,105F
U 105F, 0C00,003C,01E0,0800,0000,10AB
U 10AB, 0000,003C,01C0,0A78,0000,10AC
U 10AC, 0001,2024,0180,0800,0010,10AD
U 10AD, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

```

```

:1806 TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
:1807 .REGION/1000,13FF
:1808
:1809
:1810 FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1811 WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
:1812 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1813 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1814 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1815
:1816 FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1817 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1818 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1819 R[OF] AND DO A RETURN.
:1820
:1821 IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1822 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1823 TO THE CONSOLE.
:1824
:1825 1100: SC_K[ZERO],J/TRPH1 : SYSTEM INIT
:1826 1101: SC_K[.1],J/TRPH0 : DATA UNALIGNED
:1827 1102: SC_K[.2],J/TRPH0 : X PAGE ERROR
:1828 1103: SC_K[.3],J/TRPH0 : TB MODIFY
:1829 1104: SC_K[.4],J/TRPH0 : TB PROT ERROR
:1830 1105: SC_K[.6],J/TRPH0 : TB MISS
:1831 1106: SC_K[.9],J/TRPH0 : RES FLOAT OPER
:1832 1107: SC_K[.7],J/TRPH0 : TB PARITY
:1833 1108: SC_K[.8],J/TRPH0 : CACHE PARITY
:1834 110C: SC_K[.C],J/TRPH1 : RDS
:1835 110D: SC_K[.D],J/TRPH1 : TIME OUT
:1836 110E: SC_K[.10],J/TRPH0 : ODD ADDRESS
:1837 110F: SC_K[.F],J/TRPH1 : CS PARITY
:1838 TRPH0: Q_ID[USTACK]
:1839 Q_D,D,Q
:1840 ID[USTACK],D
:1841 Q_D,D,Q
:1842 Q-R[OF]
:1843 A[U_Q.ANDNOT.MASK,CLK.UBCC : WAS TRAP EXPECTED?
:1844 Z? : BRANCH IF NO
:1845 =0 ALU_Q.AND.MASK,R[OF],ALU,RETURN : CLEAR THE BIT AND RETURN
:1846
:1847
:1848 THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1849 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1850 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1851
:1852 DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1853 TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1854 FAULT STATUS REGISTER
:1855 SBI ERROR REGISTER
:1856 TIMEOUT ADDRESS REGISTER
:1857 MAINTENANCE REGISTER
:1858 CACHE PARITY REGISTER
:1859 TB ERROR REGISTER 1
:1860 TB ERROR REGISTER 0

```

U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,70CF :1862
U 1005, 0000,003C,49F0,2C00,0000,10AE :1863
U 10AE, 0001,203C,4DF0,2DB0,0000,10AF :1864
U 10AF, 0001,203C,65F0,2DB8,0000,10B0 :1865
U 10B0, 0001,203C,6DF0,2DD8,0000,10B1 :1866
U 10B1, 0001,203C,75F0,2DE0,0000,10B2 :1867
U 10B2, 0001,203C,79F0,2DC8,0000,10B3 :1868
U 10B3, 0001,203C,69F0,2DC0,0000,10B4 :1869
U 10B4, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,10C9 :1871

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
RC[0E] Q,ERROR1

1000:

THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

NEWTST
ERLOOP
ERROR1
ERROR2

U 10B5, 0000,003C,65F8,0800,0084,70B6 :1880
U 10B6, 0818,0038,8D80,0800,0000,10B7 :1881
U 10B7, 0D00,003C,0180,0800,0000,10B8 :1882
U 10B8, 0000,003C,3D80,3C00,0000,10B9 :1883
U 10B9, 0818,0038,0580,0800,0000,10BA :1884
U 10BA, 0D00,003C,0180,0800,0000,10BB :1885
U 10BB, 0F00,003C,3180,3C00,0000,10BC :1886
U 10BC, 0000,003C,5D80,3C00,0000,10BD :1887
U 10BD, 0000,003C,3980,3C00,0000,10BE :1888
U 10BE, 0000,003C,2980,3C00,0000,10BF :1889
U 10BF, 0000,003C,4980,3C00,0000,10C0 :1890
U 10C0, 0818,0038,C180,0800,0000,10C1 :1891
U 10C1, 0000,003C,6580,3C00,0000,10C2 :1892
U 10C2, 0F00,003C,6D80,3C00,0000,10C3 :1893
U 10C3, 0000,003C,6D80,3C00,0000,10C4 :1894
U 10C4, 0000,003C,6580,3C00,0000,10C5 :1895
U 10C5, 0003,003C,0180,09F0,0000,10C6 :1896
U 10C6, 0003,003C,0180,0AF8,0000,10C7 :1897
U 10C7, 0003,003C,0180,09E8,0000,10E :1898
U 10C8, 0818,0038,0980,0800,0000,10E :1899
U 10C9, 0810,0038,0180,0978,0000,10CA :1900
U 10CA, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,10E :1902
U 10CB, 0810,0038,0180,0978,0000,10CC :1903
U 10CC, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,10E :1905

SCOPE: SC_KC[.10],Q_0

; SETUP TO WRITE IPL OF 1F

; ...

D_KC[.1F]

D-DAL.SC

ID[PSL]_D

; WRITE THE PSL

D_KC[.1]

; SETUP TO CLEAR THE CES REGISTER

D-DAL.SC

ID[CES] D,D_0

; CLEAR THE CES REGISTER

ID[ACC].[S]_D

; SHUT OFF THE FLOATING POINT

ID[SIR]_D

; CLEAR THE SIR REGISTER

ID[CLK].[S]_D

; STOP INTERVAL TIMER

ID[TBER0]_D

; SHUT OFF THE TB

D_KC.FFFF

ID[SBI.ERR]_D

ID[FAULT]_D,D_0

ID[FAULT]_D

ID[SBI.ERR]_D

RC[0E]_0

RC[0F]_0

RC[0D]_0,J/CALLCON

; CALL THE CONSOLE

ERLOOP: D_KC[.2],J/CALLCON

; ERRLOOP CALL

ERROR1: D_RC[0F]

D_D.AND.KC.FF00

104E: D_D.OR.KC[.4],J/CALLCON

ERROR2: D_RC[0F]

D_D.AND.KC.FF00

105A: D_D.OR.KC[.6],J/CALLCON

105E:

CALLCON:

ID[TXDB]_D,J/CALLCON

; CALL THE CONSOLE

U 105E, 0000,003C,1D80,3C00,0000,105E :1908

:1909

:1910

:1911

U 13F0, 0000,003C,0180,0800,0000,13F1 :1912

U 13F1, 0000,003C,0180,0800,0000,13F2 :1913

U 13F2, 0000,003C,0180,0800,0000,13F3 :1914

U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

;+

THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

;-

13F0: NOP

13F1: NOP

13F2: NOP

13F3: NOP

U 13F4.	0000,003C,0180,0800,0000,13F5	:1916
U 13F5.	0000,003C,0180,0800,0000,13F6	:1917
U 13F6.	0000,003C,0180,0800,0000,13F7	:1918
U 13F7.	0000,003C,0180,0800,0000,13F8	:1919
U 13F8.	0000,003C,0180,0800,0000,13F9	:1920
U 13F9.	0000,003C,0180,0800,0000,13FA	:1921
U 13FA.	0000,003C,0180,0800,0000,13FB	:1922
U 13FB.	0000,003C,0180,0800,0000,13FC	:1923
U 13FC.	0000,003C,0180,0800,0000,13FD	:1924
U 13FD.	0000,003C,0180,0800,0000,13FE	:1925
U 13FE.	0000,003C,0180,0800,0000,13FF	:1926
U 13FF.	0000,003C,0180,0800,0000,1155	:1927
U 1155.	0000,003C,0180,0800,0000,12AA	:1928
U 12AA.	0000,003C,0180,0800,0000,10CD	:1929
		:1930
		:1931
		:1932
		:1933
		:1934
		:1935
U 10CD.	0810,0038,4D80,0978,0000,10CE	:1936
U 10CE.	0019,4016,4D80,09F8,0000,0001	:1937
		:1938
		:1939
		:1940
		:1941
		:1942
U 10CF.	0010,0038,01C0,0978,0000,10D0	:1943
U 10D0.	0019,2034,4DC0,0800,0000,10D1	:1944
U 10D1.	0019,2032,1D80,09F8,0000,0001	:1945
		:1946
		:1947
		:1948
		:1949
U 10D2.	0018,0038,C180,0800,0000,10D3	:1950
U 10D3.	0500,003C,0380,0800,0000,10D6	:1951
U 10D6.	0000,003D,0180,0800,0000,10E5	:1952
U 10D7.	0000,003C,0180,0800,0000,10D8	:1953
U 10D8.	0000,003D,0180,0800,0000,10E6	:1954
U 10D9.	0000,003E,0180,0800,0000,0001	:1955
		:1956
U 10D4.	0118,0038,1B80,0800,0000,10E8	:1957
U 10D5.	0118,0038,0B80,0800,0000,10E8	:1958
U 10D6.	0118,0038,0780,0800,0000,10E8	:1959
U 10D7.	0118,0038,C380,0800,0000,10E8	:1960
U 10D8.	0018,0038,1980,0800,0000,10D4	:1961
U 10D9.	0018,0038,1980,0800,0000,10D5	:1962
U 10DA.	0018,0038,1980,0800,0000,10D6	:1963
U 10DB.	0018,0038,1980,0800,0000,10D7	:1964
U 10DC.	0018,0038,0980,0800,0000,10D4	:1965
U 10DD.	0018,0038,0980,0800,0000,10D5	:1966
U 10DE.	0018,0038,0980,0800,0000,10D6	:1967
U 10DF.	0018,0038,0980,0800,0000,10D7	:1968
U 10E0.	0018,0038,0580,0800,0000,10D4	:1969
U 10E1.	0018,0038,0580,0800,0000,10D5	:1970

```

13F4:  NOP
13F5:  NOP
13F6:  NOP
13F7:  NOP
13F8:  NOP
13F9:  NOP
13FA:  NOP
13FB:  NOP
13FC:  NOP
13FD:  NOP
13FE:  NOP
13FF:  NOP
1155:  NOP
12AA:  NOP
;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-
SUBTST: D RC[0F],KMX/.FF00
        RC[0F]_D+K[.FF00],WORD,RETURN1
;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-
SETRCF: Q RC[0F]
        Q-Q.AND.K[.FF00]
        RC[0F]_Q.OR.SC,RETURN1
; THIS ROUTINE GENERATES A CONSTANT WHICH IS
; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
; CERTAIN TRAPS.
DC.1DE: ALU_K[.FFFF]
        D D.LEFT,S1/7
=0      CALL,J/DCD
        NOP
=0      CALL,J/DCE
        RETURN1
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
S00:    ALU_0(K),D D.LEFT2,S1/7,J/SX
S01:    ALU_K[.2],D D.LEFT2,S1/7,J/SX
S10:    ALU_K[.1],D D.LEFT2,S1/7,J/SX
S11:    ALU_K[.FFFF],D D.LEFT2,S1/7,J/SX
DC0:    ALU_0(K),J/S00
DC1:    ALU_0(K),J/S01
DC2:    ALU_0(K),J/S10
DC3:    ALU_0(K),J/S11
DC4:    ALU_K[.2],J/S00
DC5:    ALU_K[.2],J/S01
DC6:    ALU_K[.2],J/S10
DC7:    ALU_K[.2],J/S11
DC8:    ALU_K[.1],J/S00
DC9:    ALU_K[.1],J/S01

```



```
U 10E2, 0018,0038,0580,0800,0000,10D6 :1971 DCA: ALU_K[.1],J/S10
U 10E3, 0018,0038,0580,0800,0000,10D7 :1972 DCB: ALU_K[.1],J/S11
U 10E4, 0018,0038,C180,0800,0000,10D4 :1973 DCC: ALU_K[.FFFF],J/S00
U 10E5, 0018,0038,C180,0800,0000,10D5 :1974 DCD: ALU_K[.FFFF],J/S01
U 10E6, 0018,0038,C180,0800,0000,10D6 :1975 DCE: ALU_K[.FFFF],J/S10
U 10E7, 0018,0038,C180,0800,0000,10D7 :1976 DCF: ALU_K[.FFFF],J/S11
U 10E8, 0100,003E,0380,0800,0000,0001 :1977 SX: D_D.LEFT2,SI/7,RETURN1
U 10E9, 0018,0038,01C0,0800,0000,100A :1978 DC.5: Q_K[.8]
:1979 =0
U 100A, 0000,003D,0180,0800,0000,10DD :1980 DC.5A: CALL,J/DC5
U 100B, 0019,2000,05C0,0800,0010,10EA :1981 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 10EA, 0000,013C,0180,0800,0000,100C :1982 Z?
U 100C, 0000,003C,0180,0800,0000,100A :1983 =0
U 100D, 0000,003E,0180,0800,0000,0001 :1984 J/DC.5A
:1985 RETURN1
U 100E, 0000,003D,0180,0800,0000,10E9 :1986 DC.A: CALL,J/DC.5
U 100F, 0500,003E,0180,0800,0000,0001 :1987 D_D.LEFT,SI/ZERO,RETURN1
U 10EB, 0018,0038,01C0,0800,0000,1010 :1988 DC.9: Q_K[.8]
:1989 =0
U 1010, 0000,003D,0180,0800,0000,10E1 :1990 DC.9A: CALL,J/DC9
U 1011, 0019,2000,05C0,0800,0010,10EC :1991 ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 10EC, 0000,013C,0180,0800,0000,1012 :1992 Z?
U 1012, 0000,003C,0180,0800,0000,1010 :1993 =0
U 1013, 0000,003E,0180,0800,0000,0001 :1994 J/DC.9A
:1995 RETURN1
U 1014, 0000,003D,0180,0800,0000,10EB :1996 DC.C: CALL,J/DC.9
U 1015, 0018,0038,C180,0800,0000,10ED :1997 ALU_K[.FFFF]
U 10ED, 0600,003E,0380,0800,0000,0001 :1998 D_D.RIGHT,SI/7,RETURN1
:1999 =0
U 1016, 0000,003D,0180,0800,0000,10EB :2000 DC.6: CALL,J/DC.9
U 1017, 0018,0038,0580,0800,0000,10EE :2001 ALU_K[.1]
U 10EE, 0100,003E,0380,0800,0000,0001 :2002 D_D.LEFT2,SI/7,RETURN1
:2003 =0
U 1018, 0000,003D,0180,0800,0000,10EB :2004 DC.3: CALL,J/DC.9
U 1019, 0018,0038,C180,0800,0000,10EF :2005 ALU_K[.FFFF]
U 10EF, 0500,003E,0380,0800,0000,0001 :2006 D_D.LEFT,SI/7,RETURN1
:2007 ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
:2008 ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
:2009 ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 10F0, 0000,003F,0180,0800,0000,117C :2010 TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001 :2011 117C: RETURN1
U 117D, 0000,003E,0180,0800,0000,0002 :2012 117D: RETURN2
U 117E, 0000,003E,0180,0800,0000,0003 :2013 117E: RETURN3
U 117F, 0000,003E,0180,0800,0000,0004 :2014 117F: RETURN4
U 11FC, 0000,003D,0180,0800,0000,10C9 :2015 11FC: ERROR1
U 11FD, 0000,003D,0180,0800,0000,10C9 :2016 11FD: ERROR1
U 11FE, 0000,003D,0180,0800,0000,10C9 :2017 11FE: ERROR1
U 11FF, 0000,003D,0180,0800,0000,10C9 :2018 11FF: ERROR1
:2019 ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 10F1, 0F18,0038,5DC0,0800,0000,101A :2020 DCLA: D_0,Q_K[.7]
:2021 =0
U 101A, 0000,003D,0180,0800,0000,10E2 :2022 DCLA1: CALL,J/DCA
U 101B, 0001,203C,0180,0800,0010,10F2 :2023 ALU_Q,CLK.UBCC
U 10F2, 0000,013C,0180,0800,0000,101C :2024 Z?
U 101C, 0019,2000,05C0,0800,0000,101A :2025 =0
Q_Q-K[.1],J/DCLA1
```

```
U 101D, 0000,003E,0180,0800,0000,0001 :2026
:2027 RETURN1
:2028 ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
:2029 ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
:2030 ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
:2031 ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
:2032 ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
:2033 ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
:2034 ; WILL CONTAIN THE READ DATA.
:2035 =0
U 101E, 0F00,003D,0180,0800,0000,10DE :2036 RHOM1: D 0,CALL,J/DC6
U 101F, 0000,003C,0180,0800,0000,1025 :2037 J7READ
:2038 =0
U 1020, 0F00,003D,0180,0800,0000,10DA :2039 RHOM1: D 0,CALL,J/DC2
U 1021, 0000,003C,0180,0800,0000,1025 :2040 J7READ
:2041 =0
U 1022, 0F00,003D,0180,0800,0000,10DC :2042 RMOM1: D 0,CALL,J/DC4
U 1023, 0000,003C,0180,0800,0000,1025 :2043 J7READ
:2044 =0
U 1024, 0F00,003C,0180,0800,0000,1025 :2045 RMOM1: D 0,J/READ
U 1025, 0000,003C,01F8,0800,0084,70F3 :2046 READ: SC K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
U 10F3, 0D00,003C,0180,0800,0000,10F4 :2047 D BAL.SC
U 10F4, 0001,003C,0180,09E8,0000,10F5 :2048 RC[OD] D
U 10F5, 0000,003C,0180,0A70,0000,10F6 :2049 LAB RC[OE]
U 10F6, 0000,003C,0180,52F8,0000,10F7 :2050 RC[OF] LA,FS/MCT,MCT/READ.V.WCHK
U 10F7, 0001,003C,0180,09D0,0000,10F8 :2051 RC[OA] D
U 10F8, 0000,003C,75F0,2C00,0000,10F9 :2052 Q_ID[MAINT]
U 10F9, 0800,003C,0180,0A78,0000,10FA :2053 D-RC[OF]
U 10FA, 0003,003C,0180,0AF8,0000,10FB :2054 RC[OF] 0
U 10FB, 0001,203C,0180,09E0,0000,10FC :2055 RC[OC] Q
U 10FC, 0000,003C,01C0,0A70,0000,10FD :2056 Q RC[OE]
U 10FD, 0001,003C,0180,09C8,0000,10FE :2057 RC[9] D
U 10FE, 001D,2000,0180,0800,0010,10FF :2058 ALU_Q=D,CLK.UBCC
U 10FF, 0000,013C,0180,0800,0000,1026 :2059 Z?
U 1026, 0000,003C,0180,0800,0000,1113 :2060 =0 J/RERR
U 1027, 0818,0038,D5F8,0800,0000,1109 :2061 Q 0,D K[.6]
U 1109, 0000,003C,0180,0800,0084,710A :2062 SC K[.8]
U 110A, 0D10,0038,01C0,0960,0000,110B :2063 D BAL.SC,Q RC[OC]
U 110B, 001D,2034,01C0,0800,0000,1110 :2064 ACU_Q[AND]B,Q_ALU
U 1110, 0810,0038,0180,0968,0000,1111 :2065 D RC[OD]
U 1111, 001D,2000,0180,0800,0010,1112 :2066 ACU_Q=D,CLK.UBCC
U 1112, 0000,013C,0180,0800,0000,1028 :2067 Z?
U 1028, 0000,003E,0180,0800,0000,0002 :2068 =0 RETURN2
U 1029, 0810,003A,0180,0950,0000,0003 :2069 D_RC[OA],RETURN3
U 1113, 0000,003C,79F0,2C00,0000,1114 :2070 RERR: Q-ID[PARITY]
U 1114, 0001,203E,0180,09E8,0000,0001 :2071 RC[OD] Q,RETURN1
:2072 ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
:2073 ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
:2074 ; ELSE RETURN2.
U 1115, 0000,003C,0180,0A70,0000,1116 :2075 WRITE: LAB RC[OE]
U 1116, 0000,003C,0180,32F8,0000,1117 :2076 RC[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
U 1117, 0800,003C,0180,0A78,0000,1118 :2077 D RC[OF]
U 1118, 0003,003C,0180,0AF8,0000,1119 :2078 RC[OF] 0
U 1119, 0000,003C,01C0,0A70,0000,111A :2079 Q RC[OE]
U 111A, 001D,2000,0180,0800,0010,111B :2080 ACU_Q=D,CLK.UBCC
U 111B, 0000,013C,0180,0800,0000,102A :2080 Z?
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U 102A, 0000,003C,0180,0800,0000,1113 :2081 =0 J/RERR ; UTRAPPED.
U 102B, 0000,003E,0180,0800,0000,0002 :2082 RETURN2 ; OK NO UTRAP.
:2083 ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
:2084 ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
:2085 ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
:2086 ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
:2087 ; DISSABLE SBI CYCLES:
U 111C, 0F00,003C,0180,0800,0000,111D :2088 SOFF: D 0
U 111D, 0000,003C,8580,0800,0084,711E :2089 S1: SC_K[C]
U 111E, 0801,001C,0180,0800,0000,111F :2090 ALU D,ORNOT.MASK,D,ALU
U 111F, 0000,003E,7580,3C00,0000,0001 :2091 ID[MAINT],D,RETURN2
:2092 ; SET FORCE REPLACE GROUP ZERO BIT
U 1120, 0F00,003C,0180,0800,0000,1121 :2093 ROS: D 0
U 1121, 0000,003C,6180,0800,0084,7122 :2094 S2: SC_K[F]
U 1122, 0000,003C,0580,0800,0084,8123 :2095 SC-SC-K[1]
U 1123, 0801,001C,0180,0800,0000,111D :2096 S3: ALU D,ORNOT.MASK,D,ALU,J/S1
:2097 ; SET FORCE REPLACE GROUP T BIT
U 1124, 0F00,003C,0180,0800,0000,1125 :2098 RIS: D 0
U 1125, 0000,003C,8980,0800,0084,7123 :2099 S4: SC_K[D],J/S3
:2100 ; SET FORCE MISS GROUP 0 BIT
U 1126, 0F00,003C,0180,0800,0000,1127 :2101 MOS: D 0
U 1127, 0000,003C,6580,0800,0084,7123 :2102 S5: SC_K[10],J/S3
:2103 ; SET FORCE MISS GROUP 1 BIT
U 1128, 0F00,003C,0180,0800,0000,1129 :2104 MIS: D 0
U 1129, 0000,003C,6180,0800,0084,7123 :2105 S6: SC_K[F],J/S3
:2106 ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 112A, 0F00,003C,0180,0800,0000,112B :2107 M10S: D 0
U 112B, 0000,003C,6180,0800,0084,712C :2108 SC_K[F]
U 112C, 0801,001C,0180,0800,0000,1127 :2109 S7: ALU D,ORNOT.MASK,D,ALU,J/S5
:2110 ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 112D, 0F00,003C,0180,0800,0000,112E :2111 ROM1S: D 0
U 112E, 0000,003C,6180,0800,0084,712F :2112 SC_K[F]
U 112F, 0801,001C,0180,0800,0000,1121 :2113 ALU D,ORNOT.MASK,D,ALU,J/S2
:2114 ; SET FORCE REPLACE GROUP T FORCE MISS GROUP 0 BITS
U 1130, 0F00,003C,8980,0800,0084,712C :2115 R1MOS: D 0,SC_K[D],J/S7
:2116 ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
:2117 ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
:2118 ; THESE PATTERNS IN THE RC SCRATCH PADS.
:2119 RC[0] AAAAAAAA
:2120 RC[1] 19999000
:2121 RC[2] 55555555
:2122 RC[3] 06666000
:2123 RC[4] 99999999
:2124 RC[5] 1B6DB000
:2125 RC[6] 66666666
:2126 RC[7] 04924000
U 1131, 0F18,0038,5DC0,0800,0000,102C :2127 CAPAT: Q_K[7],D_0
:2128 =0
U 102C, 0000,003D,0180,0800,0000,10E2 :2129 CAP1: CALL,J/DCA
U 102D, 0001,203C,0180,0800,0010,1132 :2130 ALU_Q,CLK.UBCC
U 1132, 0000,013C,0180,0800,0000,102E :2131 Z?
U 102E, 0019,2000,05C0,0800,0000,102C :2132 =0 Q-Q-K[1],J/CAP1
U 102F, 0001,003C,0180,0980,0000,1133 :2133 RC[0] D
U 1133, 0001,0028,0180,0990,0000,1134 :2134 ALU NOT,D,RC[2],ALU
U 1134, 0F18,0038,5DC0,0800,0000,1030 :2135 Q_K[7],D_0
```


U 1030.	0000,003D,0180,0800,0000,10E1	:2136
U 1031.	0001,203C,0180,0800,0010,1135	:2137
U 1135.	0000,013C,0180,0800,0000,1032	:2138
U 1032.	0019,2000,05C0,0800,0000,1030	:2139
U 1033.	0001,003C,0180,09A0,0000,1136	:2140
U 1136.	0001,0028,0180,09B0,0000,1137	:2141
U 1137.	0000,003C,89F8,0800,0084,7138	:2142
U 1138.	0D00,003C,0180,0800,0000,1139	:2143
U 1139.	0600,003C,0180,0800,0000,113A	:2144
U 113A.	0001,003C,0180,0988,0000,113B	:2145
U 113B.	0810,0038,65F8,0930,0084,713C	:2146
U 113C.	0D00,003C,0180,0800,0000,113D	:2147
U 113D.	0200,003C,0180,0800,0000,113E	:2148
U 113E.	0200,003C,0180,0800,0000,113F	:2149
U 113F.	0F01,003C,0180,0998,0000,1034	:2150
U 1034.	0000,003D,0180,0800,0000,10E1	:2151
U 1035.	0100,003C,0180,0800,0000,1036	:2152
U 1036.	0000,003D,0180,0800,0000,10E1	:2153
U 1037.	0500,003C,0180,0800,0000,1038	:2154
U 1038.	0000,003D,0180,0800,0000,10DC	:2155
U 1039.	0001,0028,0180,09A8,0000,1140	:2156
U 1140.	0000,003C,85F8,0800,0084,7141	:2157
U 1141.	0D00,003C,0180,0800,0000,1142	:2158
U 1142.	0001,003C,0180,09B8,0000,1143	:2159
U 1143.	0810,0038,0180,0928,0000,1144	:2160
U 1144.	0000,003C,61F8,0800,0084,7145	:2161
U 1145.	0D00,003C,0180,0800,0000,1146	:2162
U 1146.	0200,003C,0180,0800,0000,1147	:2163
U 1147.	0600,003C,0180,0800,0000,1148	:2164
U 1148.	0001,003E,0180,09A8,0000,0001	:2165

```

=0
CAP2: CALL J/DC9
      ALU_Q,CLK.UBCC
      Z?
=0    Q Q-KC.1],J/CAP2
      RC[4] D
      ALU_NOT.D,RC[6],ALU
      Q_0,SC_KC.D]
      D_DAL.SC
      D-D.RIGHT,SI/ZERO
      RC[1] D
      D_RC[8],SC_KC.10],Q_0
      D_DAL.SC
      D-D.RIGHT2,SI/ZERO
      D-D.RIGHT2,SI/ZERO
=0    RC[3] D,D_0
=0    CALL J/DC9
      D D.LEFT2,SI/ZERO
=0    CALL J/DC9
      D D.LEFT,SI/ZERO
=0    CALL J/DC4
      ALU NOT.D,RC[5],ALU
      SC_KC.C],Q_0
      D_DAL.SC
      RC[7] D
      D RC[5]
      SC_KC.F],Q_0
      D_DAL.SC
      D-D.RIGHT2,SI/ZERO
      D-D.RIGHT,SI/ZERO
      RC[5]_D,RETURN1

```


:2167
.:2168
.:2169
.:2170
.:2171
.:2172
.:2173
.:2174
.:2175
.:2176
.:2177
.:2178
.:2179
.:2180
.:2181
.:2182
.:2183
.:2184
.:2185
.:2186
.:2187
.:2188
.:2189
.:2190
.:2191
.:2192
.:2193
.:2194
.:2195
.:2196
.:2197
.:2198
.:2199
.:2200
.:2201
.:2202
.:2203
.:2204
.:2205
.:2206
.:2207
.:2208
.:2209
.:2210
.:2211
.:2212
.:2213
.:2214
.:2215
.:2216
.:2217
.:2218
.:2219
.:2220
.:2221

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.PAGE "TEST EC BAL TEST 2"
*****
++
TEST EC BAL TEST 2

TEST DESCRIPTION
THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND BYTE MASK
GENERATOR USING DT=WORD AND VA<1:0>=11. AN ALIGNMENT
UTRAP SHOULD OCCUR AFTER THE FIRST REFERENCE BUT NOT AFTER
THE SECOND REFERENCE.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE BYTE ALIGNER IS ON DBP.

ERROR DESCRIPTION
EXPECTED DATA AT LOCATION 0
EXPECTED DATA AT LOCATION 4
GOT DATA AT LOCATION 0
GOT DATA AT LOCATION 4
ADDRESS WRITTEN
DATA WRITTEN
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

--
=0
BAL2: NEWTST
D 0,R[OF] 0
=0 ID[1BER0] D,CALL,J/SOFF ; TB AND SBI OFF
R[OF] K[7]
R[OA] K[3] ; ADDRESS BEING TESTED
=0 D 0,CALL,J/DC.1DE ; GET CONSTANT USED AS UTRAP FLAG
R[OE] D
VA K[ZERO],D 0 ; INVALIDATE LOCATION 0 IN
FS7MCT,MCT/INVALIDATE ; BOTH GROUPS
VA VA+4 ; INVALIDATE LOCATION 4

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U 103A.	0000,003D,0180,0800,0000,10B5
U 103B.	0F03,003C,0180,0AF8,0000,103C
U 103C.	0000,003D,4980,3C00,0000,111C
U 103D.	0018,0038,5D80,09F8,0000,1149
U 1149.	0018,0038,0D80,09D0,0000,103E
U 103E.	0F00,003D,0180,0800,0000,10D2
U 103F.	0001,003C,0180,0AF0,0000,114A
U 114A.	0F18,0038,1980,0800,0200,114B
U 114B.	0000,003C,0180,9000,0000,114C
U 114C.	0000,003C,0180,0803,0000,114D

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U 114D. 0000,003C,0180,9000,0000,114E :2222
U 114E. 0018,0038,6180,0AA0,0000,1040 :2223
U 1040. 0000,003D,0180,0800,0000,10C8 :2224
U 1041. 0000,003C,0180,0A20,0082,114F :2225
U 114F. 0818,0038,C180,0800,0000,1150 :2226
U 1150. 0801,0034,71F8,0800,0084,7151 :2227
U 1151. 0D00,003C,0180,0A20,0082,1152 :2228
U 1152. 0001,003C,0180,09E8,0000,1153 :2229
U 1153. 0F00,0038,71C0,09C8,0084,7154 :2230
U 1154. 0D00,003C,0180,0800,0000,1156 :2231
U 1156. 0001,003C,0180,09F0,0000,1042 :2232
U 1042. 0000,003D,0180,0800,0000,1120 :2233
U 1043. 0F18,0038,1980,0800,0200,1157 :2234
U 1157. 0000,003C,0180,9800,0000,1158 :2235
U 1158. 0F18,0038,1180,0800,0200,1159 :2236
U 1159. 0000,003C,0180,9800,0000,1044 :2237
U 1044. 0000,003D,0180,0800,0000,111C :2238
U 1045. 0018,0038,0D80,0800,0200,115A :2239
U 115A. 0810,0038,0180,0948,0000,115B :2240
U 115B. 0000,003C,0180,0A70,0000,115C :2241
U 115C. 0000,003C,0180,0AF8,0000,115D :2242
U 115D. 0000,403C,0180,3000,0000,115E :2243
U 115E. 0800,003C,0180,0A78,0000,115F :2244
U 115F. 0003,003C,0180,0AF8,0000,1160 :2245
U 1160. 0000,003C,01C0,0A70,0000,1161 :2246
U 1161. 001D,2000,0180,0800,0010,1162 :2247
U 1162. 0000,013C,0180,0800,0000,1046 :2248
U 1046. 0000,003C,0180,0800,0000,1163 :2249
U 1047. 0001,003D,0180,09C0,0000,10C9 :2250
U 1163. 0019,0034,0980,0800,0010,1164 :2251
U 1164. 0000,013C,0180,0800,0000,1048 :2252
U 1048. 0001,003D,0180,09C0,0000,10C9 :2253
U 1049. 0000,003C,0180,0803,0000,1165 :2254
U 1165. 0810,0038,0180,0948,0000,1166 :2255
U 1166. 0000,003C,0180,0A70,0000,1167 :2256
U 1167. 0000,003C,0180,0AF8,0000,1168 :2257
U 1168. 0000,003C,0180,3000,3000,1169 :2258
U 1169. 0800,003C,0180,0A78,0000,116A :2259
U 116A. 0003,003C,0180,0AF8,0000,116B :2260
U 116B. 0000,003C,01C0,0A70,0000,116C :2261
U 116C. 001D,2000,0180,0800,0010,116D :2262
U 116D. 0000,013C,0180,0800,0000,104A :2263
U 104A. 0001,003D,0180,09C0,0000,10C9 :2264
U 104B. 0018,0038,1980,0800,0200,116E :2265
U 116E. 0000,003C,0180,0A70,0000,116F :2266
U 116F. 0000,003C,0180,0AF8,0000,1170 :2267
U 1170. 0000,003C,0180,5000,0000,1171 :2268
U 1171. 0001,003C,0180,09E0,0000,1172 :2269
U 1172. 0800,003C,0180,0A78,0000,1173 :2270
U 1173. 0003,003C,0180,0AF8,0000,1174 :2271
U 1174. 0000,003C,01C0,0A70,0000,1175 :2272
U 1175. 001D,2000,0180,0800,0010,1176 :2273
U 1176. 0000,013C,0180,0800,0000,104C :2274
U 104C. 0001,003D,0180,09C0,0000,10C9 :2275
U 104D. 0018,0038,1180,0800,0200,1177 :2276

      FS/MCT,MCT/INVALIDATE : IN BOTH GROUPS
      R[4],K[F] : TEST PATTERN COUNTER
      ERLOOP
BAL2A: SC R[4] : GENERATE TEST DATA PATTERN
      D R[FFFF] : AND EXPECTED RESULTS
      A[U,D,AND,MASK,D_ALU,Q_0,SC_K[FFF8]
      D D[AL,SC,SC_R[4]
      R[OD] D
      ALU_MASK,Q_ALU,R[9]_ALU,D_0,SC_K[FFF8]
      D D[AL,SC
      R[OE] D
      CALL J7ROS : SET FORCE REPLACE GROUP 0 BIT
      VA_K[ZERO],D 0 : WRITE DATA=00000000 INTO LOCATION
      FS7MCT,MCT/VALIDATE : 0 OF GROUP 0
      VA_K[4],D 0 : WRITE DATA=00000000 INTO LOCATION 4
      FS7MCT,MCT7VALIDATE : OF GROUP 0
      CALL J/SOFF : CLEAR FORCE REPLACE BITS
      VA_K[3] : PUT TEST ADDRESS INTO VA
      D R[9] : LOAD TEST DATA PATTERN INTO D
      LAB R[OE]
      R[OF] LA : LOAD UTRAP FLAG
      FS/MCT,MCT/WRITE.V.WCHK,DT/WORD : TEST INSTRUCTION, FIRST REF. SHOULD UTRAP
      D R[OF] : SEE IF UTRAP OCCURRED
      R[OF] 0
      Q R[OE]
      A[U,Q-D,CLK.UBCC
      Z?
      J/BAL2B
      ERROR1,R[8]_D : NO UTRAP OCCURRED
BAL2B: ALU_D[AND]K[2],CLK.UBCC : SEE IF UTRAP WAS BECAUSE OF
      Z? : UNALIGNED DATA
      ERROR1,R[8]_D : UTRAP NOT BECAUSE ALIGN
      VA VA+4 : LOAD 4 INTO VA FOR SECOND REF.
      D R[9] : PLACE TEST DATA INTO D
      LAB R[OE]
      R[OF] LA : SET UP UTRAP FLAG
      FS/MCT,MCT/WRITE.V.WCHK,MSC/SECOND.REF,DT/LONG : NOTE SAVED CONTEX SHOULD B
      D R[OF] : SEE IF A UTRAP OCCURRED
      R[OF] 0
      Q R[OE]
      A[U,Q-D,CLK.UBCC
      Z?
      ERROR1,R[8]_D : UTRAPPED
      VA_K[ZERO] : READ BACK THE FIRST HALF OF THE RESULT
      LAB R[OE]
      R[OF] LA : SET UP UTRAP FLAG
      FS/MCT,MCT/READ.V.WCHK : READ LOCATION 0 IN GROUP 0
      R[OC] D : SAVE THE RESULT
      D R[OF] : SEE IF A UTRAP OCCURRED
      R[OF] 0
      Q R[OE]
      A[U,Q-D,CLK.UBCC
      Z?
      ERROR1,R[8]_D : UTRAPPED
      VA_K[4] : READ THE SECOND HALF OF THE RESULT

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U 1177.	0000,003C,0180,0A70,0000,1178	:2277	LAB R[OE]	
U 1178.	0000,003C,0180,0AF8,0000,1179	:2278	R[OF] LA	: SET UP THE UTRAP FLAG
U 1179.	0000,003C,0180,5000,0000,117A	:2279	FS/MCT,MCT/READ.V.WCHK	: READ LOCATION 4 OF GROUP 0
U 117A.	0001,003C,0180,09D8,0000,117B	:2280	R[OB] D	: SAVE THE RESULT
U 117B.	0800,003C,0180,0A78,0000,1180	:2281	D R[OF]	: SEE IF A UTRAP OCCURRED
U 1180.	0003,003C,0180,0AF8,0000,1181	:2282	R[OF] 0	
U 1181.	0000,003C,01C0,0A70,0000,1182	:2283	Q R[OE]	
U 1182.	001D,2000,0180,0800,0010,1183	:2284	A[U_Q-D,CLK.UBCC	
U 1183.	0000,013C,0180,0800,0000,1050	:2285	Z?	
U 1050.	0001,003D,0180,09C0,0000,10C9	:2286	ERROR1,R[8]_D	: UTRAPPED
U 1051.	0010,0038,01C0,0970,0000,1184	:2287	Q_R[OE]	: CHECK THE CONTENTS OF LOCATION 0
U 1184.	0810,0038,0180,0960,0000,1185	:2288	D_R[OC]	
U 1185.	001D,2000,0180,0800,0010,1186	:2289	A[U_Q-D,CLK.UBCC	
U 1186.	0000,013C,0180,0800,0000,1052	:2290	Z?	
U 1052.	0000,003D,0180,0800,0000,10C9	:2291	ERROR1	: DATA AT LOCATION 0 INCORRECT
U 1053.	0010,0038,01C0,0968,0000,1187	:2292	Q_R[OD]	: CHECK THE CONTENTS OF LOCATION 4
U 1187.	0810,0038,0180,0958,0000,1188	:2293	D_R[OB]	
U 1188.	001D,2000,0180,0800,0010,1189	:2294	A[U_Q-D,CLK.UBCC	
U 1189.	0000,013C,0180,0800,0000,1054	:2295	Z?	
U 1054.	0000,003D,0180,0800,0000,10C9	:2296	ERROR1	: DATA AT LOCATION 4 INCORRECT.
U 1055.	0000,003C,0180,0A20,0010,118A	:2297	ALU_R[4],CLK.UBCC	: HAVE ALL DATA PATTERNS BEEN TRIED?
U 118A.	0000,013C,0180,0800,0000,1056	:2298	Z?	
U 1056.	0018,0000,0580,0AA0,0000,1041	:2299	R[4]_LA-K[.1],J/BAL2A	: IF NOT CONTINUE
U 1057.	0000,003C,0180,0800,0000,1058	:2300	NOP	

.2301
.2302
.2303
.2304
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.2355

```
.PAGE 'TEST ED BAL TEST 3'
*****
++
TEST ED BAL TEST 3

TEST DESCRIPTION
THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE
MASK GENERATER USING DATA TYPE=WORD AND VA,01:00>= 10, 01 AND 00.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE BYTE ALIGNER IS ON DBP.

ERROR DESCRIPTION
EXPECTED DATA AT LOCATION 0
EXPECTED DATA AT LOCATION 4
GOT DATA AT LOCATION 0
GOT DATA AT LOCATION 4
ADDRESS WRITTEN
DATA WRITTEN
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
-----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

--
*****
=0
BAL3: NEWTST
D 0,R[0F]_0
=0 ID[1BER0]_D,CALL,J/SOFF : TB AND SBI CYCLES OFF
RC[0F]_K[7]
R[7]_K[2] : ADDRESS USED INTEST
D 0,CALL,J/DC.1DE : GET CONSTANT USED AS UTRAP FLAG
R[0E]_D
VA K[ZERO],D 0 : INVALIDATE LOCATION 0
FS7MCT,MCT/INVALIDATE : OF BOTH GROUPS
VA VA+4 : INVALIDATE LOCATION 4
FS7MCT,MCT/INVALIDATE : IN BOTH GROUPS
BAL3A: D_R[7] : INITIALIZE THE FLOATING PATTERN
```

U 1058, 0000,003D,0180,0800,0000,1085
U 1059, 0F03,003C,0180,0AF8,0000,105C
U 105C, 0000,003D,4980,3C00,0000,111C
U 105D, 0018,0038,5D80,09F8,0000,118B
U 118B, 0018,0038,0980,0AB8,0000,1060
U 1060, 0F00,003D,0180,0800,0000,10D2
U 1061, 0001,003C,0180,0AF0,0000,118C
U 118C, 0F18,0038,1980,0800,0200,118D
U 118D, 0000,003C,0180,9000,0000,118E
U 118E, 0000,003C,0180,0803,0000,118F
U 118F, 0000,003C,0180,9000,0000,1190
U 1190, 0800,003C,0180,0A38,0000,1191

U 1191, 0001,003C,0180,09D0,0000,1192 :2356
U 1192, 0100,003C,0180,0800,0000,1193 :2357
U 1193, 0500,003C,0180,0800,0000,1194 :2358
U 1194, 0001,003C,0180,0A98,0000,1195 :2359
U 1195, 0018,0038,6180,0AA0,0000,1062 :2360
U 1062, 0000,003D,0180,0800,0000,10C8 :2361
U 1063, 0000,003C,0180,0A20,0082,1196 :2362
U 1196, 0800,0038,0180,09C8,0000,1197 :2363
U 1197, 0819,0034,C180,0800,0000,1198 :2364
U 1198, 0000,003C,01F8,0A18,0082,1199 :2365
U 1199, 0D00,003C,0180,0800,0000,119A :2366
U 119A, 0001,003C,0180,09F0,0000,119B :2367
U 119B, 0003,003C,0180,09E8,0000,1064 :2368
U 1064, 0000,003D,0180,0800,0000,1120 :2369
U 1065, 0F18,0038,1980,0800,0200,119C :2370
U 119C, 0000,003C,0180,9800,0000,119D :2371
U 119D, 0F00,003C,0180,0803,0000,119E :2372
U 119E, 0000,003C,0180,9800,0000,1066 :2373
U 1066, 0000,003D,0180,0800,0000,111C :2374
U 1067, 0000,003C,0180,0A38,0200,119F :2375
U 119F, 0810,0038,0180,0948,0000,11A0 :2376
U 11A0, 0000,003C,0180,0A70,0000,11A1 :2377
U 11A1, 0000,003C,0180,0AF8,0000,11A2 :2378
U 11A2, 0000,403C,0180,3000,0000,11A3 :2379
U 11A3, 0800,003C,0180,0A78,0000,11A4 :2380
U 11A4, 0003,003C,0180,0AF8,0000,11A5 :2381
U 11A5, 0000,003C,01C0,0A70,0000,11A6 :2382
U 11A6, 001D,2000,0180,0800,0010,11A7 :2383
U 11A7, 0000,013C,0180,0800,0000,1068 :2384
U 1068, 0001,003D,0180,09C0,0000,10C9 :2385
U 1069, 0018,0038,1980,0800,0200,11A8 :2386
U 11A8, 0000,003C,0180,0A70,0000,11A9 :2387
U 11A9, 0000,003C,0180,0AF8,0000,11AA :2388
U 11AA, 0000,003C,0180,5000,0000,11AB :2389
U 11AB, 0001,003C,0180,09E0,0000,11AC :2390
U 11AC, 0800,003C,0180,0A78,0000,11AD :2391
U 11AD, 0003,003C,0180,0AF8,0000,11AE :2392
U 11AE, 0000,003C,01C0,0A70,0000,11AF :2393
U 11AF, 001D,2000,0180,0800,0010,11B0 :2394
U 11B0, 0000,013C,0180,0800,0000,106A :2395
U 106A, 0001,003D,0180,09C0,0000,10C9 :2396
U 106B, 0000,003C,0180,0803,0000,11B1 :2397
U 11B1, 0000,003C,0180,0A70,0000,11B2 :2398
U 11B2, 0000,003C,0180,0AF8,0000,11B3 :2399
U 11B3, 0000,003C,0180,5000,0000,11B4 :2400
U 11B4, 0001,003C,0180,09D8,0000,11B5 :2401
U 11B5, 0800,003C,0180,0A78,0000,11B6 :2402
U 11B6, 0003,003C,0180,0AF8,0000,11B7 :2403
U 11B7, 0000,003C,01C0,0A70,0000,11B8 :2404
U 11B8, 001D,2000,0180,0800,0010,11B9 :2405
U 11B9, 0000,013C,0180,0800,0000,106C :2406
U 106C, 0001,003D,0180,09C0,0000,10C9 :2407
U 106D, 0010,0038,01C0,0970,0000,11BA :2408
U 11BA, 0810,0038,0180,0960,0000,11BB :2409
U 11BB, 001D,2000,0180,0800,0010,11BC :2410

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RC[0A] D ; USED AS TEST DATA.
D_D.LEFT2,SI/ZERO
D_D.LEFT,SI/ZERO
R[3] D
R[4] K[F] ; TEST PATTERN COUNTER
ERLOOP
BAL3B: SC R[4] ; GENERATE THE TEST DATA
ALD_MASK,R[9] ALU,D_ALU ; PATTERN AND THE EXPECTED RESULT
ALU_D[AND]K[F.FFFF],D_ALU
SC R[3],Q_0
D_BAL.SC
R[0E] D
R[0D] 0
CALL J7ROS ; SET THE FORCE REPLACE GROUP 0 BIT
VA_K[ZERO],D_0 ; WRITE DATA=0 INTO LOCATION 0
FS/MCT,MCT/VALIDATE ; OF GROUP 0
VA VA+4,D_0 ; WRITE DATA=0 INTO LOCATION 4
FS/MCT,MCT/VALIDATE ; OF GROUP 0
CALL J/SOFF ; CLEAR THE FORCE REPLACE BITS
VA R[7] ; LOAD THE TEST ADDRESS INTO THE VA
D R[9] ; PUT THE TEST DATA INTO D
LAB R[0E]
R[0F] LA ; SET UP THE UTRAP FLAG
FS/MCT,MCT/WRITE.V.WCHK,DT/WORD ; TEST INSTRUCTION, SHOULD NOT UTRAP
D R[0F] ; SEE IF A UTRAP OCCURRED
R[0F] 0
Q R[0E]
A[U_Q-D,CLK.UBCC]
Z?
ERROR1,R[8]_D ; REFERENCE CAUSED UTRAP
VA_K[ZERO] ; GET FIRST HALF OF THE RESULT
LAB R[0E]
R[0F] LA ; SET UP UTRAP FLAG
FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 0 FROM GROUP 0
R[0C] D ; SAVE THE RESULT
D R[0F] ; SEE IF A UTRAP OCCURRED
R[0F] 0
Q R[0E]
A[U_Q-D,CLK.UBCC]
Z?
ERROR1,R[8]_D ; A UTRAP OCCURRED ON THE REFERENCE
VA VA+4 ; GET THE SECOND HALF OF THE RESULT
LAB R[0E]
R[0F] LA ; SET UP THE UTRAP FLAG
FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 4 FROM GROUP 0
R[0B] D ; SAVE THE RESULT
D R[0F] ; SEE IF A UTRAP OCCURRED
R[0F] 0
Q R[0E]
A[U_Q-D,CLK.UBCC]
Z?
ERROR1,R[8]_D ; A UTRAP OCCURRED ON THE REFERENCE
Q R[0E] ; CHECK THE DATA AT LOCATION 0
D_R[0C]
A[U_Q-D,CLK.UBCC]

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ZZ-ESKAH-V132 TEST ED BAL TEST 3
ESKAH31.MCR MICRO2 1M(01)

C 10

16-DEC-82 11:54:18

SEQ 0733
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U 11BC, 0000,013C,0180,0800,0000,106E	:2411		Z?	
U 106E, 0000,003D,0180,0800,0000,10C9	:2412	=0	ERROR1	: DATA AT LOCATION 0 INCORRECT
U 106F, 0010,0038,0180,0968,0010,11BD	:2413		ALU_RC[0D],CLK.UBCC	: CHECK THE DATA AT LOCATION 4
U 11BD, 0000,013C,0180,0800,0000,1070	:2414		Z?	
U 1070, 0000,003D,0180,0800,0000,10C9	:2415	=0	ERROR1	: DATA AT LOCATION 4 INCORRECT
U 1071, 0000,003C,0180,0A20,0010,11BE	:2416		ALU_R[4],CLK.UBCC	: TRIED ALL DATA PATTERNS?
U 11BE, 0000,013C,0180,0800,0000,1072	:2417		Z?	
U 1072, 0018,0000,0580,0AA0,0000,1063	:2418	=0	R[4]_LA-K[.1],J/BAL3B	: IF NOT CONTINUE
U 1073, 0000,003C,0180,0A38,0010,11BF	:2419		ALU_R[7],CLK.UBCC	: HAS EACH ADDRESS 2, 1 AND 0 BEEN TESTED?
U 11BF, 0000,013C,0180,0800,0000,1074	:2420		Z?	
U 1074, 0018,0000,0580,0AB8,0000,1190	:2421	=0	R[7]_LA-K[.1],J/BAL3A	: IF NOT CONTINUE
U 1075, 0000,003C,0180,0800,0000,1076	:2422		NOP	

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:2423 .PAGE "TEST EE BAL TEST 4"
:2424 *****
:2425 ++
:2426 TEST EE BAL TEST 4
:2427
:2428 TEST DESCRIPTION
:2429 THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
:2430 GENERATER USING DT=BYTE AND VA<1:0>= 11, 10, 01 AND 00.
:2431 THIS TEST USES GROUP 0 IN THE CACHE.
:2432
:2433 LOGIC DESCRIPTION
:2434 TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
:2435 PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
:2436 THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
:2437 TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
:2438 CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
:2439 IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
:2440 IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
:2441 ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
:2442 REGISTER ON THE SBI CONTROL MODULE.
:2443 THE BYTE ALIGNER IS ON DBP.
:2444
:2445 ERROR DESCRIPTION
:2446 EXPECTED DATA AT LOCATION 0
:2447 EXPECTED DATA AT LOCATION 4
:2448 GOT DATA AT LOCATION 0
:2449 GOT DATA AT LOCATION 4
:2450 ADDRESS WRITTEN
:2451 DATA WRITTEN
:2452 UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
:2453 FLAG UTRAP TYPE
:2454 ----
:2455 1DE NO UTRAP OCCURRED
:2456 DE CACHE PARITY UTRAP
:2457 15E TB PARITY ERROR
:2458 19E TB MISS
:2459 1CE TB PROTECTION ERROR
:2460 1D6 TB MODIFY BIT ERROR
:2461 1DA X PAGE UTRAP
:2462 1DC UNALIGNED DATA UTRAP
:2463
:2464 --
:2465 *****
:2466 =0
:2467 BAL4: NEWTST
:2468 D 0
:2469 =0 ID[ZERO] D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
:2470 RC[0F] K[7]
:2471 RC[7] K[3] ; ADDRESS USED IN THIS TEST
:2472 =0 D 0,CALL,J/DC.1DE ; GET THE CONSTANT USED AS UTRAP FLAG
:2473 R[0E] D
:2474 VA K[ZERO],R[0F] K[ZERO],D 0 ; INVALIDATE LOCATION 0
:2475 FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
:2476 VA VA+4,D 0 ; INVALIDATE LOCATION 4
:2477 FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS

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U 1076, 0000,003D,0180,0800,0000,10B5
U 1077, 0F00,003C,0180,0800,0000,1078
U 1078, 0000,003D,4980,3C00,0000,111C
U 1079, 0018,0038,5D80,09F8,0000,11C0
U 11C0, 0018,0038,0D80,0AB8,0000,107A
U 107A, 0F00,003D,0180,0800,0000,10D2
U 107B, 0001,003C,0180,0AF0,0000,11C1
U 11C1, 0F18,0038,1980,0AF8,0200,11C2
U 11C2, 0000,003C,0180,9000,0000,11C3
U 11C3, 0F00,003C,0180,0803,0000,11C4
U 11C4, 0000,003C,0180,9000,0000,11C5

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U 11C5, 0800,003C,0180,0A38,0000,11C6 :2478
U 11C6, 0001,003C,0180,09D0,0000,11C7 :2479
U 11C7, 0500,003C,0180,0800,0000,11C8 :2480
U 11C8, 0100,003C,0180,0800,0000,11C9 :2481
U 11C9, 0001,003C,0180,0A98,0000,11CA :2482
U 11CA, 0018,0038,5D80,0AA0,0000,107C :2483
U 107C, 0000,003D,0180,0800,0000,10C8 :2484
U 107D, 0000,003C,0180,0A20,0082,11CB :2485
U 11CB, 0800,0038,0180,09C8,0000,11CC :2486
U 11CC, 0819,0034,4980,0800,0000,11CD :2487
U 11CD, 0000,003C,01F8,0A18,0082,11CE :2488
U 11CE, 0D00,003C,0180,0800,0000,11CF :2489
U 11CF, 0001,003C,0180,09F0,0000,11D0 :2490
U 11D0, 0003,003C,0180,09E8,0000,107E :2491
U 107E, 0000,003D,0180,0800,0000,1120 :2492
U 107F, 0F18,0038,1980,0800,0200,11D1 :2493
U 11D1, 0000,003C,0180,9800,0000,11D2 :2494
U 11D2, 0F00,003C,0180,0803,0000,11D3 :2495
U 11D3, 0000,003C,0180,9800,0000,1080 :2496
U 1080, 0000,003D,0180,0800,0000,111C :2497
U 1081, 0000,003C,0180,0A38,0200,11D4 :2498
U 11D4, 0810,0038,0180,0948,0000,11D5 :2499
U 11D5, 0000,003C,0180,0A70,0000,11D6 :2500
U 11D6, 0000,003C,0180,0AF8,0000,11D7 :2501
U 11D7, 0000,803C,0180,3000,0000,11D8 :2502
U 11D8, 0800,003C,0180,0A78,0000,11D9 :2503
U 11D9, 0003,003C,0180,0AF8,0000,11DA :2504
U 11DA, 0000,003C,01C0,0A70,0000,11DB :2505
U 11DB, 001D,2000,0180,0800,0010,11DC :2506
U 11DC, 0000,013C,0180,0800,0000,1082 :2507
U 1082, 0001,003D,0180,09C0,0000,10C9 :2508
U 1083, 0018,0038,1980,0800,0200,11DD :2509
U 11DD, 0000,003C,0180,0A70,0000,11DE :2510
U 11DE, 0000,003C,0180,0AF8,0000,11DF :2511
U 11DF, 0000,003C,0180,5000,0000,11E0 :2512
U 11E0, 0001,003C,0180,09E0,0000,11E1 :2513
U 11E1, 0800,003C,0180,0A78,0000,11E2 :2514
U 11E2, 0003,003C,0180,0AF8,0000,11E3 :2515
U 11E3, 0000,003C,01C0,0A70,0000,11E4 :2516
U 11E4, 001D,2000,0180,0800,0010,11E5 :2517
U 11E5, 0000,013C,0180,0800,0000,1084 :2518
U 1084, 0001,003D,0180,09C0,0000,10C9 :2519
U 1085, 0000,003C,0180,0803,0000,11E6 :2520
U 11E6, 0000,003C,0180,0A70,0000,11E7 :2521
U 11E7, 0000,003C,0180,0AF8,0000,11E8 :2522
U 11E8, 0000,003C,0180,5000,0000,11E9 :2523
U 11E9, 0001,003C,0180,09D8,0000,11EA :2524
U 11EA, 0800,003C,0180,0A78,0000,11EB :2525
U 11EB, 0003,003C,0180,0AF8,0000,11EC :2526
U 11EC, 0000,003C,01C0,0A70,0000,11ED :2527
U 11ED, 001D,2000,0180,0800,0010,11EE :2528
U 11EE, 0000,013C,0180,0800,0000,1086 :2529
U 1086, 0001,003D,0180,09C0,0000,10C9 :2530
U 1087, 0010,0038,01C0,0970,0000,11EF :2531
U 11EF, 0810,0038,0180,0960,0000,11F0 :2532

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BAL4A: D RC[7] ; INITIALIZE THE TEST
        RC[0A] D ; DATA PATTERN
        D-D.LEFT,SI/ZERO
        D-D.LEFT2,SI/ZERO
        RC[3] D
        RC[4]-K[.7] ; COUNTER FOR TEST PATTERNS
=0      ERLOOP
BAL4B: SC RC[4] ; GENERATE THE TEST DATA AND
        ALU_MASK,RC[9] ALU,D,ALU ; EXPECTED RESULTS
        ALU-D[AND]K[.FF],D,ALU
        SC RC[3],Q_0
        D-BAL.SC
        RC[0E] D
        RC[0D]-0
=0      CALL J7ROS ; SET THE FORCE REPLACE GROUP 0 BIT
        VA K[ZERO],D 0 ; WRITE DATA=00000000 INTO LOCATION 0
        FS7MCT,MCT/VALIDATE ; OF GROUP 0
        VA VA+4,D 0 ; WRITE DATA=00000000 INTO LOCATION 4
        FS7MCT,MCT/VALIDATE ; OF GROUP 0
=0      CALL J/SOFF ; CLEAR THE FORCE REPLACE BITS
        VA RC[7] ; PUT THE TEST ADDRESS INTO THE VA
        D RC[9] ; PUT THE TEST DATA INTO THE D REG
        LAB RC[0E]
        RC[0F] LA ; SET UP THE UTRAP FLAG
        FS/MCT,MCT/WRITE.V.WCHK,DT/BYTE ; TEST INSTRUCTION, SHOULD NOT UTRAP
        D RC[0F] ; SEE IF A UTRAP OCCURRED
        RC[0F] 0
        Q RC[0E]
        ACU_Q-D,CLK.UBCC
        Z?
=0      ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENCE WITH DT=BYTE
        VA K[ZERO] ; READ BACK THE FIRST HALF OF THE RESULT
        LAB RC[0E]
        RC[0F] LA ; SET UP THE UTRAP FLAG
        FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 0 OF GROUP 0
        RC[0C] D ; SAVE THE DATA
        D RC[0F] ; SEE IF A UTRAP OCCURRED
        RC[0F] 0
        Q RC[0E]
        ACU_Q-D,CLK.UBCC
        Z?
=0      ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENCE
        VA VA+4 ; READ BACK THE SECOND HALF OF THE RESULT
        LAB RC[0E]
        RC[0F] LA ; SET UP THE UTRAP FLAG
        FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 4 FROM GROUP 0
        RC[0B] D ; SAVE THE RESULT
        D RC[0F] ; SEE IF A UTRAP OCCURRED
        RC[0F] 0
        Q RC[0E]
        ACU_Q-D,CLK.UBCC
        Z?
=0      ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENEC
        Q RC[0E] ; CHECK THE DATA AT LOCATION 0
        D-RC[0C]

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U 11F0.	001D,2000,0180,0800,0010,11F1	:2533	ALU_Q-D,CLK.UBCC	
U 11F1.	0000,013C,0180,0800,0000,1088	:2534	Z?	
U 1088.	0000,003D,0180,0800,0000,10C9	:2535	=0 ERROR1	: DATA AT LOCATION 0 INCORRECT
U 1089.	0010,0038,01C0,0968,0000,11F2	:2536	Q_RC[0D]	: CHECK THE DATA AT LOCATION 4
U 11F2.	0810,0038,0180,0958,0000,11F3	:2537	D-RC[0B]	
U 11F3.	001D,2000,0180,0800,0010,11F4	:2538	A[U_Q-D,CLK.UBCC	
U 11F4.	0000,013C,0180,0800,0000,108A	:2539	Z?	
U 108A.	0000,003D,0180,0800,0000,10C9	:2540	=0 ERROR1	: DATA AT LOCTION 4 INCORRECT
U 108B.	0000,003C,0180,0A20,0010,11F5	:2541	ALU_R[4],CLK.UBCC	: HAVE ALL TEST PATTERNS BEEN TRIED?
U 11F5.	0000,013C,0180,0800,0000,108C	:2542	Z?	
U 108C.	0018,0000,0580,0AA0,0000,107D	:2543	=0 R[4]_LA-K[.1],J/BAL4B	: IF NOT CONTINUE
U 108D.	0000,003C,0180,0A38,0010,11F6	:2544	ALU_R[7],CLK.UBCC	: HAS EACH ADDRESS 3, 2, 1 AND 0 BEEN TESTED?
U 11F6.	0000,013C,0180,0800,0000,108E	:2545	Z?	
U 108E.	0018,0000,0580,0AB8,0000,11C5	:2546	=0 R[7]_LA-K[.1],J/BAL4A	: IF NOT CONTINUE WITH NEXT
U 108F.	0000,003C,0180,0800,0000,1090	:2547	NOP	

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U 1090, 0000,003D,0180,0800,0000,10B5
U 1091, 0F00,003C,0180,0800,0000,1092
U 1092, 0000,003D,4980,3C00,0000,111C
U 1093, 0018,0038,5D80,09F8,0000,11F7
U 11F7, 0018,0038,0D80,0AB8,0000,1094
U 1094, 0F00,003D,0180,0800,0000,10D2
U 1095, 0001,003C,0180,0AF0,0000,11F8
U 11F8, 0F18,0038,1980,0AF8,0200,11F9
U 11F9, 0000,003C,0180,9000,0000,11FA
U 11FA, 0F00,003C,0180,0803,0000,11FB
U 11FB, 0000,003C,0180,9000,0000,1200

```
.PAGE "TEST EF BAL TEST 5"
*****
++
TEST EF BAL TEST 5

TEST DESCRIPTION
THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
GENERATER USING DT=BYTE AND VA<1:0>= 11, 10, 01 AND 00.
THIS TEST USES GROUP 1 IN THE CACHE.

LOGIC DESCRIPTION
TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
REGISTER ON THE SBI CONTROL MODULE.
THE BYTE ALIGNER IS ON DBP.

ERROR DESCRIPTION
EXPECTED DATA AT LOCATION 0
EXPECTED DATA AT LOCATION 4
GOT DATA AT LOCATION 0
GOT DATA AT LOCATION 4
ADDRESS WRITTEN
DATA WRITTEN
UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
FLAG UTRAP TYPE
----
1DE NO UTRAP OCCURRED
DE CACHE PARITY UTRAP
15E TB PARITY ERROR
19E TB MISS
1CE TB PROTECTION ERROR
1D6 TB MODIFY BIT ERROR
1DA X PAGE UTRAP
1DC UNALIGNED DATA UTRAP

--
*****
=0
BAL5: NEWTST
D 0
=0 ID[ZERO] D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
RC[0F] K[-7]
R[7] K[3] ; ADDRESS USED IN THIS TEST
=0 D 0,CALL,J/DC.1DE ; GET THE CONSTANT USED AS UTRAP FLAG
R[0E] D
VA K[ZERO],RC[0F] K[ZERO],D 0 ; INVALIDATE LOCATION 0
FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
VA VA+4,D 0 ; INVALIDATE LOCATION 4
FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
```

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U 1200, 0800,003C,0180,0A38,0000,1201 :2603 BAL5A: D RC[7] ; INITIALIZE THE TEST
U 1201, 0001,003C,0180,09D0,0000,1202 :2604 RC[0A] D ; DATA PATTERN
U 1202, 0500,003C,0180,0800,0000,1203 :2605 D D LEFT,SI/ZERO
U 1203, 0100,003C,0180,0800,0000,1204 :2606 D D LEFT2,SI/ZERO
U 1204, 0001,003C,0180,0A98,0000,1205 :2607 RC[3] D
U 1205, 0018,0038,5D80,0AA0,0000,1096 :2608 RC[4] K[.7] ; COUNTER FOR TEST PATTERNS
U 1096, 0000,003D,0180,0800,0000,10C8 :2609 =0 ERLOOP
U 1097, 0000,003C,0180,0A20,0082,1206 :2610 BAL5B: SC RC[4] ; GENERATE THE TEST DATA AND
U 1206, 0800,0038,0180,09C8,0000,1207 :2611 ALU MASK,RC[9] ALU,D ALU ; EXPECTED RESULTS
U 1207, 0819,0034,4980,0800,0000,1208 :2612 ALU D[AND]K[.FF],D ACU
U 1208, 0000,003C,01F8,0A18,0082,1209 :2613 SC RC[3],Q_0
U 1209, 0D00,003C,0180,0800,0000,120A :2614 D BAL SC
U 120A, 0001,003C,0180,09F0,0000,120B :2615 RC[0E] D
U 120B, 0003,003C,0180,09E8,0000,1098 :2616 RC[0D] 0
U 1098, 0000,003D,0180,0800,0000,1124 :2617 =0 CALL J7R1S ; SET THE FORCE REPLACE GROUP 1 BIT
U 1099, 0F18,0038,1980,0800,0200,120C :2618 VA K[ZERO],D 0 ; WRITE DATA=00000000 INTO LOCATION 0
U 120C, 0000,003C,0180,9800,0000,120D :2619 FS7MCT,MCT/VALIDATE ; OF GROUP 1
U 120D, 0F00,003C,0180,0803,0000,120E :2620 VA VA+4,D 0 ; WRITE DATA=00000000 INTO LOCATION 4
U 120E, 0000,003C,0180,9800,0000,109A :2621 FS7MCT,MCT/VALIDATE ; OF GROUP 1
U 109A, 0000,003D,0180,0800,0000,111C :2622 =0 CALL J/SOFF ; CLEAR THE FORCE REPLACE BITS
U 109B, 0000,003C,0180,0A38,0200,120F :2623 VA R[7] ; PUT THE TEST ADDRESS INTO THE VA
U 120F, 0810,0038,0180,0948,0000,1210 :2624 D RC[9] ; PUT THE TEST DATA INTO THE D REG
U 1210, 0000,003C,0180,0A70,0000,1211 :2625 LAB RC[0E]
U 1211, 0000,003C,0180,0AF8,0000,1212 :2626 RC[0F] LA ; SET UP THE UTRAP FLAG
U 1212, 0000,803C,0180,3000,0000,1213 :2627 FS/MCT,MCT/WRITE.V.WCHK,DT/BYTE ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 1213, 0800,003C,0180,0A78,0000,1214 :2628 D RC[0F] ; SEE IF A UTRAP OCCURRED
U 1214, 0003,003C,0180,0AF8,0000,1215 :2629 RC[0F] 0
U 1215, 0000,003C,01C0,0A70,0000,1216 :2630 Q RC[0E]
U 1216, 001D,2000,0180,0800,0010,1217 :2631 ACU_Q-D,CLK.UBCC
U 1217, 0000,013C,0180,0800,0000,109C :2632 Z?
U 109C, 0001,003D,0180,09C0,0000,10C9 :2633 =0 ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENCE WITH DT=BYTE
U 109D, 0018,0038,1980,0800,0200,1218 :2634 VA K[ZERO] ; READ BACK THE FIRST HALF OF THE RESULT
U 1218, 0000,003C,0180,0A70,0000,1219 :2635 LAB RC[0E]
U 1219, 0000,003C,0180,0AF8,0000,121A :2636 RC[0F] LA ; SET UP THE UTRAP FLAG
U 121A, 0000,003C,0180,5000,0000,121B :2637 FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 0 OF GROUP 1
U 121B, 0001,003C,0180,09E0,0000,121C :2638 RC[0C] D ; SAVE THE DATA
U 121C, 0800,003C,0180,0A78,0000,121D :2639 D RC[0F] ; SEE IF A UTRAP OCCURRED
U 121D, 0003,003C,0180,0AF8,0000,121E :2640 RC[0F] 0
U 121E, 0000,003C,01C0,0A70,0000,121F :2641 Q RC[0E]
U 121F, 001D,2000,0180,0800,0010,1220 :2642 ACU_Q-D,CLK.UBCC
U 1220, 0000,013C,0180,0800,0000,109E :2643 Z?
U 109E, 0001,003D,0180,09C0,0000,10C9 :2644 =0 ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENCE
U 109F, 0000,003C,0180,0803,0000,1221 :2645 VA VA+4 ; READ BACK THE SECOND HALF OF THE RESULT
U 1221, 0000,003C,0180,0A70,0000,1222 :2646 LAB RC[0E]
U 1222, 0000,003C,0180,0AF8,0000,1223 :2647 RC[0F] LA ; SET UP THE UTRAP FLAG
U 1223, 0000,003C,0180,5000,0000,1224 :2648 FS/MCT,MCT/READ.V.WCHK ; READ LOCATION 4 FROM GROUP 1
U 1224, 0001,003C,0180,09D8,0000,1225 :2649 RC[0B] D ; SAVE THE RESULT
U 1225, 0800,003C,0180,0A78,0000,1226 :2650 D RC[0F] ; SEE IF A UTRAP OCCURRED
U 1226, 0003,003C,0180,0AF8,0000,1227 :2651 RC[0F] 0
U 1227, 0000,003C,01C0,0A70,0000,1228 :2652 Q RC[0E]
U 1228, 001D,2000,0180,0800,0010,1229 :2653 ACU_Q-D,CLK.UBCC
U 1229, 0000,013C,0180,0800,0000,10A0 :2654 Z?
U 10A0, 0001,003D,0180,09C0,0000,10C9 :2655 =0 ERROR1,RC[8]_D ; A UTRAP OCCURRED ON THE REFERENC
U 10A1, 0010,0038,01C0,0970,0000,122A :2656 Q RC[0E] ; CHECK THE DATA AT LOCATION 0
U 122A, 0810,0038,0180,0960,0000,122B :2657 D RC[0C]

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U 122B,	001D,2000,0180,0800,0010,122C	:2658		ALU_Q-D,CLK.UBCC	
U 122C,	0000,013C,0180,0800,0000,10A2	:2659		Z?	
U 10A2,	0000,003D,0180,0800,0000,10C9	:2660	=0	ERROR1	: DATA AT LOCATION 0 INCORRECT
U 10A3,	0010,0038,01C0,0968,0000,122D	:2661		Q_RC[0D]	: CHECK THE DATA AT LOCATION 4
U 122D,	0810,0038,0180,0958,0000,122E	:2662		D_RC[0B]	
U 122E,	001D,2000,0180,0800,0010,122F	:2663		A[U_Q-D,CLK.UBCC	
U 122F,	0000,013C,0180,0800,0000,10A4	:2664		Z?	
U 10A4,	0000,003D,0180,0800,0000,10C9	:2665	=0	ERROR1	: DATA AT LOCATION 4 INCORRECT
U 10A5,	0000,003C,0180,0A20,0010,1230	:2666		ALU_R[4],CLK.UBCC	: HAVE ALL TEST PATTERNS BEEN TRIED?
U 1230,	0000,013C,0180,0800,0000,10A6	:2667		Z?	
U 10A6,	0018,0000,0580,0AA0,0000,1097	:2668	=0	R[4]_LA-K[.1],J/BAL5B	: IF NOT CONTINUE
U 10A7,	0000,003C,0180,0A38,0010,1231	:2669		ALU_R[7],CLK.UBCC	: HAS EACH ADDRESS 3, 2, 1 AND 0 BEEN TESTED?
U 1231,	0000,013C,0180,0800,0000,10A8	:2670		Z?	
U 10A8,	0018,0000,0580,0AB8,0000,1200	:2671	=0	R[7]_LA-K[.1],J/BAL5A	: IF NOT CONTINUE WITH NEXT
U 10A9,	0000,003C,0180,0800,0000,10AA	:2672		NOP	
		:2673	=0		
U 10AA,	0000,003D,0180,0800,0000,10B5	:2674		DUMMY1: NEWTST	

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871:	1838	1845=	1861=	1862=	1863=	1952=	1953=
U 1008	1954=	1955=	1980=	1981=	1983=	1984=	1986=	1987=
U 1010	1990=	1991=	1993=	1994=	1996=	1997=	2000=	2001=
U 1018	2004=	2005=	2022=	2023=	2025=	2026=	2035=	2036=
U 1020	2038=	2039=	2041=	2042=	2044=	2045=	2059=	2060=
U 1028	2067=	2068=	2081=	2082=	2129=	2130=	2132=	2133=
U 1030	2137=	2138=	2140=	2141=	2152=	2153=	2154=	2155=
U 1038	2156=	2157=	2212=	2213=	2214=	2215=	2217=	2218=
U 1040	2224=	2225=	2233=	2234=	2238=	2239=	2249=	2250=
U 1048	2253=	2254=	2264=	2265=	2275=	2276=	1902:	1839
U 1050	2286=	2287=	2291=	2292=	2296=	2297=	2299=	2300=
U 1058	2344=	2345=	1905:	1840	2346=	2347=	1908:	1841
U 1060	2349=	2350=	2361=	2362=	2369=	2370=	2374=	2375=
U 1068	2385=	2386=	2396=	2397=	2407=	2408=	2412=	2413=
U 1070	2415=	2416=	2418=	2419=	2421=	2422=	2467=	2468=
U 1078	2469=	2470=	2472=	2473=	2484=	2485=	2492=	2493=
U 1080	2497=	2498=	2508=	2509=	2519=	2520=	2530=	2531=
U 1088	2535=	2536=	2540=	2541=	2543=	2544=	2546=	2547=
U 1090	2592=	2593=	2594=	2595=	2597=	2598=	2609=	2610=
U 1098	2617=	2618=	2622=	2623=	2633=	2634=	2644=	2645=
U 10A0	2655=	2656=	2660=	2661=	2665=	2666=	2668=	2669=
U 10A8	2671=	2672=	2674=	1842	1843	1844	1864	1865
U 10B0	1866	1867	1868	1869	1870	1880	1881	1882
U 10B8	1883	1884	1885	1886	1887	1888	1889	1890
U 10C0	1891	1892	1893	1894	1895	1896	1897	1898
U 10C8	1899	1900	1901	1903	1904	1936	1937	1943
U 10D0	1944	1945	1950	1951	1957	1958	1959	1960
U 10D8	1961	1962	1963	1964	1965	1966	1967	1968
U 10E0	1969	1970	1971	1972	1973	1974	1975	1976
U 10E8	1977	1978	1982	1988	1992	1998	2002	2006
U 10F0	2010	2020	2024	2046	2047	2048	2049	2050
U 10F8	2051	2052	2053	2054	2055	2056	2057	2058
U 1100	1825:	1826:	1827:	1828:	1829:	1830:	1831:	1832:
U 1108	1833:	2061	2062	2063	1834:	1835:	1836:	1837:
U 1110	2064	2065	2066	2069	2070	2074	2075	2076
U 1118	2077	2078	2079	2080	2088	2089	2090	2091
U 1120	2093	2094	2095	2096	2098	2099	2101	2102
U 1128	2104	2105	2107	2108	2109	2111	2112	2113
U 1130	2115	2127	2131	2134	2135	2139	2142	2143
U 1138	2144	2145	2146	2147	2148	2149	2150	2151
U 1140	2158	2159	2160	2161	2162	2163	2164	2165
U 1148	2166	2216	2219	2220	2221	2222	2223	2226
U 1150	2227	2228	2229	2230	2231			

;Location		0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U	11A0	2377	2378	2379	2380	2381	2382	2383	2384
U	11A8	2387	2388	2389	2390	2391	2392	2393	2394
U	11B0	2395	2398	2399	2400	2401	2402	2403	2404
U	11B8	2405	2406	2409	2410	2411	2414	2417	2420
U	11C0	2471	2474	2475	2476	2477	2478	2479	2480
U	11C8	2481	2482	2483	2486	2487	2488	2489	2490
U	11D0	2491	2494	2495	2496	2499	2500	2501	2502
U	11D8	2503	2504	2505	2506	2507	2510	2511	2512
U	11E0	2513	2514	2515	2516	2517	2518	2521	2522
U	11E8	2523	2524	2525	2526	2527	2528	2529	2532
U	11F0	2533	2534	2537	2538	2539	2542	2545	2596
U	11F8	2599	2600	2601	2602	2015:	2016:	2017:	2018:
U	1200	2603	2604	2605	2606	2607	2608	2611	2612
U	1208	2613	2614	2615	2616	2619	2620	2621	2624
U	1210	2625	2626	2627	2628	2629	2630	2631	2632
U	1218	2635	2636	2637	2638	2639	2640	2641	2642
U	1220	2643	2646	2647	2648	2649	2650	2651	2652
U	1228	2653	2654	2657	2658	2659	2662	2663	2664
U	1230	2667	2670						
U	1238 - 12A7	Unused							
U	12A8			1929:					
U	12B0 - 13EF	Unused							
U	13FC	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U	13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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ESKAH31.MCR

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SEQ 0742
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Words not
in bounds

ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH31	579

Used 579
Remaining

Total microwords used in memory U: 579
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH31.MIC

```
Pass 1 warnings:    0    Pass 2 warnings:    0
Pass 1 errors:      0    Pass 2 errors:      0
```

[illegible]

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 1806	MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
: 2318	TEST F0 INCREMENT VIBA FUNCTION TEST
: 2377	TEST F1 INCREMENT IPA FUNCTION TEST
: 2433	TEST F2 AUTO RELOAD TEST 1
: 2540	TEST F3 AUTO RELOAD TEST 2
: 2677	TEST F4 AUTO RELOAD TEST 3
: 2812	TEST F5 AUTO RELOAD TEST 4
: 2947	TEST F6 AUTO RELOAD TEST 5

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22-ESKAM-V132 Subroutines
ESKAM32.MCR

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SEQ 0745
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:1804
:1805

.NOLIST
.LIST

TOC 'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES'
REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF]. R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED. THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN R[OF] AND DO A RETURN.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL TO THE CONSOLE.

1100: SC_K[ZERO],J/TRPH1 ; SYSTEM INIT
1101: SC_K[.1],J/TRPH0 ; DATA UNALIGNED
1102: SC_K[.2],J/TRPH0 ; X PAGE ERROR
1103: SC_K[.3],J/TRPH0 ; TB MODIFY
1104: SC_K[.4],J/TRPH0 ; TB PROT ERROR
1105: SC_K[.6],J/TRPH0 ; TB MISS
1106: SC_K[.9],J/TRPH0 ; RES FLOAT OPER
1107: SC_K[.7],J/TRPH0 ; TB PARITY
1108: SC_K[.8],J/TRPH0 ; CACHE PARITY
110C: SC_K[.C],J/TRPH1 ; RDS
110D: SC_K[.D],J/TRPH1 ; TIME OUT
110E: SC_K[.10],J/TRPH0 ; ODD ADDRESS
110F: SC_K[.F],J/TRPH1 ; CS PARITY

TRPH0: Q_ID[USTACK]
Q_D,D,Q
ID[USTACK],D
Q_D,D,Q
Q-R[OF]
ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU_Q.AND.MASK,R[OF],ALU,RETURN ; CLEAR THE BIT AND RETURN

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED. IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
TRAP CODE--INDICATES WHICH TRAP OCCURRED
FAULT STATUS REGISTER
SBI ERROR REGISTER
TIMEOUT ADDRESS REGISTER
MAINTENANCE REGISTER
CACHE PARITY REGISTER
TB ERROR REGISTER 1
TB ERROR REGISTER 0

U 1100, 0000,003C,1980,0800,0084,7003
U 1101, 0000,003C,0580,0800,0084,7001
U 1102, 0000,003C,0980,0800,0084,7001
U 1103, 0000,003C,0D80,0800,0084,7001
U 1104, 0000,003C,1180,0800,0084,7001
U 1105, 0000,003C,D580,0800,0084,7001
U 1106, 0000,003C,D980,0800,0084,7001
U 1107, 0000,003C,5D80,0800,0084,7001
U 1108, 0000,003C,0180,0800,0084,7001
U 110C, 0000,003C,8580,0800,0084,7003
U 110D, 0000,003C,8980,0800,0084,7003
U 110E, 0000,003C,6580,0800,0084,7001
U 110F, 0000,003C,6180,0800,0084,7003
U 1001, 0000,003C,81F0,2C00,0000,104F
U 104F, 0C00,003C,01E0,0800,0000,105B
U 105B, 0000,003C,8180,3C00,0000,105F
U 105F, 0C00,003C,01E0,0800,0000,1109
U 1109, 0000,003C,01C0,0A78,0000,1154
U 1154, 0001,2024,0180,0800,0010,1166
U 1166, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

ZZ-ESKAH-V132 Subroutines
ESKAH32.MCR

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U 1003, 0018,0038,1D80,09E8,0000,1004 :1861
U 1004, 0000,003D,D980,0800,0084,7188 :1862
U 1005, 0000,003C,49F0,2C00,0000,1167 :1863
U 1167, 0001,203C,4DF0,2DB0,0000,1168 :1864
U 1168, 0001,203C,65F0,2DB8,0000,1169 :1865
U 1169, 0001,203C,6DF0,2DD8,0000,116A :1866
U 116A, 0001,203C,75F0,2DE0,0000,116B :1867
U 116B, 0001,203C,79F0,2DC8,0000,116C :1868
U 116C, 0001,203C,69F0,2DC0,0000,116D :1869
U 116D, 0001,203C,81F0,2DD0,0000,1000 :1870
U 1000, 0001,203D,0180,09F0,0000,1182 :1871
:1872
:1873
:1874
:1875
:1876
:1877
:1878
:1879
U 116E, 0000,003C,65F8,0800,0084,716F :1880
U 116F, 0818,0038,8D80,0800,0000,1170 :1881
U 1170, 0D00,003C,0180,0800,0000,1171 :1882
U 1171, 0000,003C,3D80,3C00,0000,1172 :1883
U 1172, 0818,0038,0580,0800,0000,1173 :1884
U 1173, 0D00,003C,0180,0800,0000,1174 :1885
U 1174, 0F00,003C,3180,3C00,0000,1175 :1886
U 1175, 0000,003C,5D80,3C00,0000,1176 :1887
U 1176, 0000,003C,3980,3C00,0000,1177 :1888
U 1177, 0000,003C,2980,3C00,0000,1178 :1889
U 1178, 0000,003C,4980,3C00,0000,1179 :1890
U 1179, 0818,0038,C180,0800,0000,117A :1891
U 117A, 0000,003C,6580,3C00,0000,117B :1892
U 117B, 0F00,003C,6D80,3C00,0000,117C :1893
U 117C, 0000,003C,6D80,3C00,0000,117D :1894
U 117D, 0000,003C,6580,3C00,0000,117E :1895
U 117E, 0003,003C,0180,09F0,0000,117F :1896
U 117F, 0003,003C,0180,0AF8,0000,1180 :1897
U 1180, 0003,003C,0180,09E8,0000,105E :1898
U 1181, 0818,0038,0980,0800,0000,105E :1899
U 1182, 0810,0038,0180,0978,0000,1183 :1900
U 1183, 0819,0034,4D80,0800,0000,104E :1901
U 104E, 0819,0030,1180,0800,0000,105E :1902
U 1184, 0810,0038,0180,0978,0000,1185 :1903
U 1185, 0819,0034,4D80,0800,0000,105A :1904
U 105A, 0819,0030,D580,0800,0000,105E :1905
:1906
:1907
U 105E, 0000,003C,1D80,3C00,0000,105E :1908
:1909
:1910
:1911
U 13F0, 0000,003C,0180,0800,0000,13F1 :1912
U 13F1, 0000,003C,0180,0800,0000,13F2 :1913
U 13F2, 0000,003C,0180,0800,0000,13F3 :1914
U 13F3, 0000,003C,0180,0800,0000,13F4 :1915

```

```

TRPH1: RC[0D],SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6],Q,Q_ID[TBER1]
RC[7],Q,Q_ID[SBI.ERR]
RC[0B],Q,Q_ID[FAULT]
RC[0C],Q,Q_ID[MAINT]
RC[9],Q,Q_ID[PARITY]
RC[8],Q,Q_ID[TIME.ADDR]
RC[0A],Q,Q_ID[USTACK]
1000: RC[0E],Q,ERROR1

```

```

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

```

```

: NEWTST
: ERLOOP
: ERROR1
: ERROR2

```

```

SCOPE: SC_K[.10],Q_0

```

```

: SETUP TO WRITE IPL OF 1F
: ...

```

```

: WRITE THE PSL
: SETUP TO CLEAR THE CES REGISTER

```

```

: CLEAR THE CES REGISTER
: SHUT OFF THE FLOATING POINT
: CLEAR THE SIR REGISTER
: STOP INTERVAL TIMER
: SHUT OFF THE TB

```

```

ERLOOP: D_K[.2],J/CALLCON
ERROR1: D_RC[0F]
104E: D_D.AND.K[.FF00]
ERROR2: D_RC[0F]
105A: D_D.AND.K[.FF00]
105E: D_D.OR.K[.6],J/CALLCON

```

```

: CALL THE CONSOLE
: ERRLOOP CALL

```

```

CALLCON: ID[TXDB],D,J/CALLCON

```

```

: CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP

```


ZZ-ESKAH-V132 Subroutines
ESKAH32.MCR

MICRO2 1M(01)

16-DEC-82 11:59:02

U 13F4, 0000,003C,0180,0800,0000,13F5 :1916
 U 13F5, 0000,003C,0180,0800,0000,13F6 :1917
 U 13F6, 0000,003C,0180,0800,0000,13F7 :1918
 U 13F7, 0000,003C,0180,0800,0000,13F8 :1919
 U 13F8, 0000,003C,0180,0800,0000,13F9 :1920
 U 13F9, 0000,003C,0180,0800,0000,13FA :1921
 U 13FA, 0000,003C,0180,0800,0000,13FB :1922
 U 13FB, 0000,003C,0180,0800,0000,13FC :1923
 U 13FC, 0000,003C,0180,0800,0000,13FD :1924
 U 13FD, 0000,003C,0180,0800,0000,13FE :1925
 U 13FE, 0000,003C,0180,0800,0000,13FF :1926
 U 13FF, 0000,003C,0180,0800,0000,1155 :1927
 U 1155, 0000,003C,0180,0800,0000,12AA :1928
 U 12AA, 0000,003C,0180,0800,0000,1186 :1929

13F4: NOP
 13F5: NOP
 13F6: NOP
 13F7: NOP
 13F8: NOP
 13F9: NOP
 13FA: NOP
 13FB: NOP
 13FC: NOP
 13FD: NOP
 13FE: NOP
 13FF: NOP
 1155: NOP
 12AA: NOP

:1930
 :+
 : THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
 : THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
 : TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
 : TYPING IT.
 :1931
 :1932
 :1933
 :1934

:1935
 :1936 SUBTST: D RC[0F],KMX/.FF00
 :1937 RC[0F]_D+K[.FF00],WORD,RETURN1
 :1938

:+
 : THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
 : LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
 : WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
 :1939
 :1940
 :1941
 :1942

:1943 SETRCF: Q RC[0F]
 :1944 Q-Q.AND.K[.FF00]
 :1945 RC[0F]_Q.OR.SC,RETURN1
 :1946

: THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
 : AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
 : UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
 : ARE LOST.
 :1947
 :1948
 :1949

:1950 CSOFF: D 0,Q 0,ALU K[.FFFF]
 :1951 =0 D-D.LEFT,S177,CALL,J/DC9
 :1952 SC K[C]
 :1953 D DAL.SC
 :1954 ID[MAINT] D,RETURN1
 :1955

: THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
 : BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
 :1956
 :1957

:1958 COFF: D K[C],Q 0
 :1959 SC K[F]
 :1960 D DAL.SC
 :1961 ID[MAINT] D,RETURN1
 :1962

: THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
 : APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
 :1963

:1964 SOFF: SC K[C]
 :1965 ALD NOT.MASK,D ALU
 :1966 ID[MAINT] D,RETURN1
 :1967

: THIS ROUTINE GENERATES A CONSTANT WHICH IS
 : USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
 : CERTAIN TRAPS.
 :1968
 :1969
 :1970

U 1186, 0810,0038,4D80,0978,0000,1187 :1936
 U 1187, 0019,4016,4D80,09F8,0000,0001 :1937

U 1188, 0010,0038,01C0,0978,0000,1189 :1943
 U 1189, 0019,2034,4DC0,0800,0000,118A :1944
 U 118A, 0019,2032,1D80,09F8,0000,0001 :1945

U 118B, 0F18,0038,C1F8,0800,0000,1006 :1951
 U 1006, 0500,003D,0380,0800,0000,11EE :1952
 U 1007, 0000,003C,8580,0800,0084,718C :1953
 U 118C, 0D00,003C,0180,0800,0000,118D :1954
 U 118D, 0000,003E,7580,3C00,0000,0001 :1955

U 118E, 0818,0038,0DF8,0800,0000,118F :1958
 U 118F, 0000,003C,6180,0800,0084,7190 :1959
 U 1190, 0D00,003C,0180,0800,0000,1191 :1960
 U 1191, 0000,003E,7580,3C00,0000,0001 :1961

U 1192, 0000,003C,8580,0800,0084,7193 :1964
 U 1193, 0803,001C,0180,0800,0000,1194 :1965
 U 1194, 0000,003E,7580,3C00,0000,0001 :1966

```

U 1008, 0000,003D,0180,0800,0000,11F2 ;1971
U 1009, 0000,003C,0180,0800,0000,100A ;1972
U 100A, 0000,003D,0180,0800,0000,11F3 ;1973
U 100B, 0000,003E,0180,0800,0000,0001 ;1974
;1975
;1976
;1977
;1978
;1979
;1980
;1981
;1982
U 100C, 0F00,003D,0180,0800,0000,11ED ;1983
U 100D, 0100,003C,0180,0800,0000,100E ;1984
U 100E, 0100,003D,0180,0800,0000,11E5 ;1985
U 100F, 0100,003C,0180,0800,0000,1010 ;1986
U 1010, 0100,003D,0180,0800,0000,11E6 ;1987
U 1011, 0800,003C,4980,3E40,0000,1195 ;1988
U 1195, 0000,003C,4180,3C00,0000,1196 ;1989
U 1196, 0000,003E,4DF0,2C00,0000,0001 ;1990
;1991
;1992
U 1012, 0F00,003D,0180,0800,0000,11E9 ;1993
U 1013, 0000,003C,0180,0800,0000,100D ;1994
;1995
;1996
U 1014, 0F00,003D,0180,0800,0000,11ED ;1997
U 1015, 0500,003C,0180,0800,0000,100D ;1998
;1999
U 1197, 0818,0038,0580,0800,0000,1011 ;2000
;2001
;2002
;2003
;2004
;2005
;2006
U 1016, 0800,003D,0180,0A30,0000,11E5 ;2007
U 1017, 0500,003C,0980,0A28,0084,7018 ;2008
U 1018, 0003,0011,01C0,0800,0000,11E5 ;2009
U 1019, 001C,0024,01C0,0800,0000,1198 ;2010
U 1198, 081D,0030,0180,0800,0000,1199 ;2011
U 1199, 0200,003C,0180,0800,0000,119A ;2012
U 119A, 0001,003E,0180,0AB8,0000,0001 ;2013
;2014
;2015
;2016
;2017
;2018
U 119B, 0000,003C,0180,0A70,0000,119C ;2019
U 119C, 0000,003C,0180,52F8,0000,119D ;2020
U 119D, 0800,003C,69F0,2E78,0000,119E ;2021
U 119E, 0018,0038,1980,0AF8,0000,119F ;2022
U 119F, 0000,003C,0180,0A70,0000,11A0 ;2023
U 11A0, 001C,2000,0180,0800,0010,11A1 ;2024
U 11A1, 0000,013C,0180,0800,0000,101A ;2025

```

```

DC.DE: CALL,J/DCD
NOP
=0 CALL,J/DCE
RETURN1
; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
; D AND Q ARE LOST.
; THIS ROUTINE WRITES GROUP 1
=0
TBWR1: D_0,CALL,J/DC8
TBWR: D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC0
D_D.LEFT2,SI/ZERO
=0 D_D.LEFT2,SI/ZERO,CALL,J/DC1
TBWRA: ID[TBER0] D,D_R[8]
ID[TBUF] D
Q_ID[TBER1],RETURN1
; ROUTINE TO WRITE GROUP 0
=0
TBWR0: D_0,CALL,J/DC4
J7TBWR
; ROUTINE TO WRITE BOTH GROUP 0 AND 1
=0
TBWRB: D_0,CALL,J/DC8
D_D.LEFT,SI/ZERO,J/TBWR
; THIS ROUTINE WRITES THE TB RANDOMLY.
TBWRAN: D_K[1],J/TBWRA
; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
=0
RELSUB: D_R[6],CALL,J/DC0
D_D.LEFT,SI/ZERO,SC_K[9],LAB_R[5]
=0 A[U_MASK+1,Q_ALU,CALL,J/DC0
ALU_LA[ANDNOT]Q,Q_ALU
ALU_D[OR]Q,D_ALU
D_D.RIGHT2,SI/ZERO
R[7] D,RETURN1
; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
; INDICATED IN R[E].
RELCHK: LAB_R[0E]
R[0F] LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERENCE
Q_ID[TIME.ADDR],D_R[0F]
A[U_0(K),R[0F],ALD
LAB_R[0E]
ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURRED.
Z?

```

```
U 101A, 0001,003E,0180,09F0,0000,0001 :2026 =0 RC[OE]_D,RETURN1 ; TRAPPED SO RETURN1.
U 101B, 0000,003C,0180,0800,0000,101C :2027 NOP
U 101C, 0F00,003D,0180,0800,0000,11F3 :2028 =0 D_0,CALL,J/DCE ; MASK OFF THE UPPER 4 BITS
U 101D, 0500,003C,0180,0800,0000,11A2 :2029 D-D.LEFT,SI/ZERO
U 11A2, 0001,003C,0180,0800,0082,11A3 :2030 SC D
U 11A3, 0803,0010,0180,0800,0000,11A4 :2031 ALU_MASK+1,D,ALU
U 11A4, 001D,2024,01C0,0800,0000,11A5 :2032 ALU_Q[ANDNOT]D,Q_ALU
U 11A5, 0800,003C,0180,0A38,0000,11A6 :2033 D R[7] ; SEE IF ADDRESS RELOCATED
U 11A6, 0018,0038,0D80,09F8,0000,11A7 :2034 RC[OF]_K[.3]
U 11A7, 0001,003C,0180,09F0,0000,11A8 :2035 RC[OE]_D
U 11A8, 0001,203C,0180,09E8,0000,11A9 :2036 RC[OD]_Q
U 11A9, 001D,2000,0180,0800,0010,11AA :2037 ALU_Q-D,CLK.UBCC ; PROPERLY.
U 11AA, 0000,013C,0180,0800,0000,101E :2038 Z?
U 101E, 0000,003E,0180,0800,0000,0002 :2039 =0 RETURN2 ; INCORRECT.
U 101F, 0000,003E,0180,0800,0000,0003 :2040 RETURN3 ; OK
:2041 ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
:2042 ; IF NO TRAP OCCURS WHEN THE REFERENCE IS MADE EXECUTE A RETURN1.
:2043 ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
:2044 ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 11AB, 0000,003C,0180,0A70,0000,11AC :2045 MISS: LAB RC[OE]
U 11AC, 0000,003C,0180,52F8,0000,11AD :2046 RC[OF] LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 11AD, 0800,003C,0180,0A78,0000,11AE :2047 D RC[OF]
U 11AE, 0018,0038,1980,0AF8,0000,11AF :2048 ACU_Q(K),RC[OF]_ALU
U 11AF, 0000,003C,0180,0A70,0000,11B0 :2049 LAB RC[OE]
U 11B0, 0001,003C,0180,09F0,0000,11B1 :2050 RC[OE] D
U 11B1, 001C,2000,0180,0800,0010,11B2 :2051 ALU_LA[A-B]D,CLK.UBCC ; SEE IF A TRAP OCCURED.
U 11B2, 0000,013C,0180,0800,0000,1020 :2052 Z?
U 1020, 0000,003C,0180,0800,0000,11B3 :2053 =0 J/MISSA
U 1021, 0000,003E,0180,0800,0000,0001 :2054 RETURN1 ; NO TRAP SO RETURN1.
U 11B3, 0000,003C,D580,0800,0084,71B4 :2055 MISSA: SC K[.6] ; IF A TRAP OCCURRED SEE
U 11B4, 0001,0024,0180,0800,0010,11B5 :2056 ALU_D.ANDNOT.MASK,CLK.UBCC ; IF IT WAS A TB MISS TRAP.
U 11B5, 0000,013C,0180,0800,0000,1022 :2057 Z?
U 1022, 0000,003E,0180,0800,0000,0002 :2058 =0 RETURN2 ; NOT TB MISS.
U 1023, 0000,003E,0180,0800,0000,0003 :2059 RETURN3 ; TB MISS.
:2060 ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
:2061 ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
:2062 ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
:2063 ; HIT/MISS BIT IN TBERO IS INCORRECT.
:2064 ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
:2065 ; CHECK HIT IN GROUP 0.
U 11B6, 0000,003C,D580,0A70,0084,71B7 :2066 HIT0: LAB RC[OE],SC K[.6]
U 11B7, 0000,003C,0180,52F8,0000,11B8 :2067 HIT: RC[OF] LA,FS/MCT,MCT/READ.V.WCHK ; NO TRAP IF HIT
U 11B8, 0800,003C,49F0,2E78,0000,11B9 :2068 Q_ID[TBERO],D RC[OF]
U 11B9, 0018,0038,1980,0AF8,0000,11BA :2069 ACU_Q(K),RC[OF]_ALU
U 11BA, 0001,203C,0180,09F0,0000,11BB :2070 RC[OE] Q
U 11BB, 0000,003C,0180,0A70,0000,11BC :2071 LAB RC[OE]
U 11BC, 001C,2000,0180,0800,0010,11BD :2072 ALU_LA[A-B]D,CLK.UBCC ; SEE IF TRAP OCCURRED.
U 11BD, 0000,013C,0180,0800,0000,1024 :2073 Z?
U 1024, 0000,003C,0180,0800,0000,11BF :2074 =0 J/HITA ; TRAP OCCURRED.
U 1025, 0001,2024,0180,0800,0010,11BE :2075 ALU_Q.ANDNOT.MASK,CLK.UBCC ; NO TRAP BUT IS HIT/MISS BIT SET?
U 11BE, 0000,013C,0180,0800,0000,1026 :2076 Z?
U 1026, 0000,003E,0180,0800,0000,0004 :2077 =0 RETURN4 ; SET SO IT WAS A HIT.
U 1027, 0000,003E,0180,0800,0000,0003 :2078 RETURN3 ; CLEAR SO REFERENCE WAS A MISS.
U 11BF, 0000,003C,D580,0800,0084,71C0 :2079 HITA: SC K[.6] ; TRAPPED, SO SEE IF TB MISS TRAP.
U 11C0, 0001,0024,0180,0800,0010,11C1 :2080 ALU_D.ANDNOT.MASK,CLK.UBCC
```



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U 11C1, 0000,013C,0180,0800,0000,1028 :2081
U 1028, 0000,003E,0180,0800,0000,0001 :2082
U 1029, 0000,003E,0180,0800,0000,0002 :2083
:2084
U 11C2, 0000,003C,5D80,0A70,0084,71B7 :2085
:2086
:2087
:2088
:2089
:2090
:2091
:2092
:2093
:2094
:2095
:2096
:2097
:2098
:2099
:2100
:2101
:2102
:2103
:2104
:2105
:2106
:2107
:2108
:2109
:2110
U 11C3, 0F18,0038,0580,0800,0000,11C4 :2111
U 11C4, 0218,0038,0880,0800,0000,11C5 :2112
U 11C5, 0218,0038,0880,0800,0000,11C6 :2113
U 11C6, 0200,003C,0380,0800,0000,11C7 :2114
U 11C7, 0001,003C,0180,0AE0,0000,11C8 :2115
U 11C8, 0000,003C,6180,0800,0084,71C9 :2116
U 11C9, 0043,0010,0180,0AD8,0000,11CA :2117
U 11CA, 081B,0000,0580,0800,0000,11CB :2118
U 11CB, 0018,0038,21C0,0800,0000,11CC :2119
U 11CC, 0019,2014,0580,0800,0082,11CD :2120
U 11CD, 0003,001C,01C0,0800,0000,11CE :2121
U 11CE, 001D,2014,0180,0AE8,0000,102A :2122
U 102A, 0000,003D,0180,0800,0000,11F6 :2123
U 102B, 0000,003C,0180,0A68,0000,11CF :2124
U 11CF, 081C,2034,0180,0800,0000,11D0 :2125
U 11D0, 081C,2030,0180,0A60,0000,11D1 :2126
U 11D1, 0001,003C,0180,0980,0000,102C :2127
U 102C, 0001,003D,0180,0AB0,0000,1052 :2128
U 102D, 0000,003C,0180,0A58,0000,11D2 :2129
U 11D2, 081C,2034,0180,0988,0000,102E :2130
U 102E, 0001,003D,0180,0AA8,0000,1016 :2131
U 102F, 0001,003C,0180,0990,0000,1030 :2132
U 1030, 0000,003D,0180,0800,0000,11F8 :2133
U 1031, 0000,003C,0180,0A68,0000,11D3 :2134
U 11D3, 081C,2034,0180,0800,0000,11D4 :2135

```

```

Z?
=0 RETURN1 ; NOT TB MISS TRAP.
RETURN2 ; TB MISS TRAP OCCURRED.
; CHECK HIT IN GROUP 1.
HIT1: LAB R[OE],SC_K[.7],J/HIT
; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
; FOLLOWING DATA PATTERNS:
:2090
:2091 R[OB] 7FFFC000
:2092 R[OC] A4000000
:2093 R[OD] 001FFFFFF
:2094
:2095 R[C0] A4155555
:2096 R[C1] 4CCCC000
:2097 R[C2] 0AAAAA80
:2098
:2099 R[C3] A4199999
:2100 R[C4] 55554000
:2101 R[C5] 0CCCCC80
:2102
:2103 R[C6] A40AAAAA
:2104 R[C7] 33330000
:2105 R[C8] 05555500
:2106
:2107 R[C9] A4066666
:2108 R[OA] 2AAA8000
:2109 R[OB] 03333300
:2110
TBWPTP: D_0,ALU_K[.1]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7,ALU_K[.2]
D_D.RIGHT2,SI/7
R[OC] D
SC_K[.F]
ALD_MASK+1,R[OB],ALU.RIGHT,SI/ZERO
D_0=K[.1]
Q_K[.14]
AEU_Q+K[.1],SC_ALU
ALU_NOT.MASK,Q_ALU
ALU_Q[A+B]D,R[OD],ALU
=0 CALL,J/DC.5
LAB_R[OD]
ALU_LA[AND]D,D_ALU
LAB_R[OC],ALU_[A[OR]D,D_ALU
R[C0] D
=0 R[C6] B,CALL,J/DC.C
LAB_R[OB]
ALU_LA[AND]D,D_ALU,R[C1],ALU
=0 R[C5] D,CALL,J/RELSUB
R[C2] D
=0 CALL,J/DC.9
LAB_R[OD]
ALU_LA[AND]D,D_ALU

```



```
U 11D4, 081C,2030,0180,0A60,0000,11D5 :2136 LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11D5, 0001,003C,0180,0998,0000,1032 :2137 R[6] D
U 1032, 0001,003D,0180,0AB0,0000,11F6 :2138 =0 R[6] D,CALL,J/DC.5
U 1033, 0000,003C,0180,0A58,0000,11D6 :2139 LAB_R[OB]
U 11D6, 081C,2034,0180,09A0,0000,1034 :2140 ALU_LA[AND]D,D_ALU,R[4]_ALU
U 1034, 0001,003D,0180,0AAB,0000,1016 :2141 =0 R[5] D,CALL,J/RELSUB
U 1035, 0001,003C,0180,09A8,0000,1036 :2142 R[5] D
U 1036, 0000,003D,0180,0800,0000,104A :2143 =0 CALL,J/DC.A
U 1037, 0000,003C,0180,0A68,0000,11D7 :2144 LAB_R[OD]
U 11D7, 081C,2034,0180,0800,0000,11D8 :2145 ALU_LA[AND]D,D_ALU
U 11D8, 081C,2030,0180,0A60,0000,11D9 :2146 LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11D9, 0001,003C,0180,09B0,0000,1038 :2147 R[6] D
U 1038, 0001,003D,0180,0AB0,0000,1056 :2148 =0 R[6] D,CALL,J/DC.3
U 1039, 0000,003C,0180,0A58,0000,11DA :2149 LAB_R[OB]
U 11DA, 081C,2034,0180,09B8,0000,103A :2150 ALU_LA[AND]D,D_ALU,R[7]_ALU
U 103A, 0001,003D,0180,0AAB,0000,1016 :2151 =0 R[5] D,CALL,J/RELSUB
U 103B, 0001,003C,0180,09C0,0000,103C :2152 R[6] D
U 103C, 0000,003D,0180,0800,0000,1054 :2153 =0 CALL,J/DC.6
U 103D, 0000,003C,0180,0A68,0000,11DB :2154 LAB_R[OD]
U 11DB, 081C,2034,0180,0800,0000,11DC :2155 ALU_LA[AND]D,D_ALU
U 11DC, 081C,2030,0180,0A60,0000,11DD :2156 LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11DD, 0001,003C,0180,09C8,0000,103E :2157 R[6] D
U 103E, 0001,003D,0180,0AB0,0000,104A :2158 =0 R[6] D,CALL,J/DC.A
U 103F, 0000,003C,0180,0A58,0000,11DE :2159 LAB_R[OB]
U 11DE, 081C,2034,0180,09D0,0000,1040 :2160 ALU_LA[AND]D,D_ALU,R[0A]_ALU
U 1040, 0001,003D,0180,0AAB,0000,1016 :2161 =0 R[5] D,CALL,J/RELSUB
U 1041, 0001,003E,0180,09D8,0000,0001 :2162 R[0B] D,RETURN1
:2163 ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
:2164 ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
:2165 ; CERTAIN TRAPS.
U 11DF, 0018,0038,C180,0800,0000,11E0 :2166 DC.1DE: ALU_K[FFFF]
U 11E0, 0500,003C,0380,0800,0000,1042 :2167 D D.LEFT,S1/7
U 1042, 0000,003D,0180,0800,0000,11F2 :2168 =0 CALL,J/DCD
U 1043, 0000,003C,0180,0800,0000,1044 :2169 NOP
U 1044, 0000,003D,0180,0800,0000,11F3 :2170 =0 CALL,J/DCE
U 1045, 0000,003E,0180,0800,0000,0001 :2171 RETURN1
:2172 ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11E1, 0118,0038,1B80,0800,0000,11F5 :2173 S00: ALU_0(K),D D.LEFT2,S1/7,J/SX
U 11E2, 0118,0038,0B80,0800,0000,11F5 :2174 S01: ALU_K[.2],D D.LEFT2,S1/7,J/SX
U 11E3, 0118,0038,0780,0800,0000,11F5 :2175 S10: ALU_K[.1],D D.LEFT2,S1/7,J/SX
U 11E4, 0118,0038,C380,0800,0000,11F5 :2176 S11: ALU_K[FFFF],D D.LEFT2,S1/7,J/SX
U 11E5, 0018,0038,1980,0800,0000,11E1 :2177 DC0: ALU_0(K),J/S00
U 11E6, 0018,0038,1980,0800,0000,11E2 :2178 DC1: ALU_0(K),J/S01
U 11E7, 0018,0038,1980,0800,0000,11E3 :2179 DC2: ALU_0(K),J/S10
U 11E8, 0018,0038,1980,0800,0000,11E4 :2180 DC3: ALU_0(K),J/S11
U 11E9, 0018,0038,0980,0800,0000,11E1 :2181 DC4: ALU_K[.2],J/S00
U 11EA, 0018,0038,0980,0800,0000,11E2 :2182 DC5: ALU_K[.2],J/S01
U 11EB, 0018,0038,0980,0800,0000,11E3 :2183 DC6: ALU_K[.2],J/S10
U 11EC, 0018,0038,0980,0800,0000,11E4 :2184 DC7: ALU_K[.2],J/S11
U 11ED, 0018,0038,0580,0800,0000,11E1 :2185 DC8: ALU_K[.1],J/S00
U 11EE, 0018,0038,0580,0800,0000,11E2 :2186 DC9: ALU_K[.1],J/S01
U 11EF, 0018,0038,0580,0800,0000,11E3 :2187 DCA: ALU_K[.1],J/S10
U 11F0, 0018,0038,0580,0800,0000,11E4 :2188 DCB: ALU_K[.1],J/S11
U 11F1, 0018,0038,C180,0800,0000,11E1 :2189 DCC: ALU_K[FFFF],J/S00
U 11F2, 0018,0038,C180,0800,0000,11E2 :2190 DCD: ALU_K[FFFF],J/S01
```

U 11F3, 0018,0038,C180,0800,0000,11E3 :2191
U 11F4, 0018,0038,C180,0800,0000,11E4 :2192
U 11F5, 0100,003E,0380,0800,0000,0001 :2193
U 11F6, 0018,0038,01C0,0800,0000,1046 :2194
:2195
U 1046, 0000,003D,0180,0800,0000,11EA :2196
U 1047, 0019,2000,05C0,0800,0010,11F7 :2197
U 11F7, 0000,013C,0180,0800,0000,1048 :2198
U 1048, 0000,003C,0180,0800,0000,1046 :2199
U 1049, 0000,003E,0180,0800,0000,0001 :2200
:2201
U 104A, 0000,003D,0180,0800,0000,11F6 :2202
U 104B, 0500,003E,0180,0800,0000,0001 :2203
U 11F8, 0018,0038,01C0,0800,0000,104C :2204
:2205
U 104C, 0000,003D,0180,0800,0000,11EE :2206
U 104D, 0019,2000,05C0,0800,0010,11F9 :2207
U 11F9, 0000,013C,0180,0800,0000,1050 :2208
U 1050, 0000,003C,0180,0800,0000,104C :2209
U 1051, 0000,003E,0180,0800,0000,0001 :2210
:2211
U 1052, 0000,003D,0180,0800,0000,11F8 :2212
U 1053, 0018,0038,C180,0800,0000,11FA :2213
U 11FA, 0600,003E,0380,0800,0000,0001 :2214
:2215
U 1054, 0000,003D,0180,0800,0000,11F8 :2216
U 1055, 0018,0038,0580,0800,0000,11FB :2217
U 11FB, 0100,003E,0380,0800,0000,0001 :2218
:2219
U 1056, 0000,003D,0180,0800,0000,11F8 :2220
U 1057, 0018,0038,C180,0800,0000,11FC :2221
U 11FC, 0500,003E,0380,0800,0000,0001 :2222
:2223
U 11FD, 0F18,0038,5DC0,0800,0000,1058 :2224
:2225
U 1058, 0000,003D,0180,0800,0000,11EF :2226
U 1059, 0001,203C,0180,0800,0010,11FE :2227
U 11FE, 0000,013C,0180,0800,0000,105C :2228
U 105C, 0019,2000,05C0,0800,0000,1058 :2229
U 105D, 0000,003E,0180,0800,0000,0001 :2230
:2231
:2232
:2233
:2234
:2235
:2236
:2237
:2238
U 1060, 0F00,003D,0180,0800,0000,11EB :2239
U 1061, 0000,003C,0180,0800,0000,1067 :2240
:2241
U 1062, 0F00,003D,0180,0800,0000,11E7 :2242
U 1063, 0000,003C,0180,0800,0000,1067 :2243
:2244
U 1064, 0F00,003D,0180,0800,0000,11E9 :2245

DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11
SX: D_D.LEFT2,SI/7,RETURN1
DC.5: Q_K[.8]

=0
DC.5A: CALL,J/DC5
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0
J/DC.5A
RETURN1

=0
DC.A: CALL,J/DC.5
D_D.LEFT,SI/ZERO,RETURN1
DC.9: Q_K[.8]

=0
DC.9A: CALL,J/DC9
ALU_Q-K[.1],Q_ALU,CLK.UBCC
Z?
=0
J/DC.9A
RETURN1

=0
DC.C: CALL,J/DC.9
ALU_K[.FFFF]
D_D.RIGHT,SI/7,RETURN1

=0
DC.6: CALL,J/DC.9
ALU_K[.1]
D_D.LEFT2,SI/7,RETURN1

=0
DC.3: CALL,J/DC.9
ALU_K[.FFFF]
D_D.LEFT,SI/7,RETURN1

: THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.
DCLA: D_0,Q_K[.7]

=0
DCLA1: CALL,J/DCA
ALU_Q,CLK.UBCC
Z?
=0
Q_Q-K[.1],J/DCLA1
RETURN1

: THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
: THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
: IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
: UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
: IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
: TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
: WILL CONTAIN THE READ DATA.

=0
RHOH1: D_0,CALL,J/DC6
J7READ

=0
RHOM1: D_0,CALL,J/DC2
J7READ

=0
RMOH1: D_0,CALL,J/DC4

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U 1065, 0000,003C,0180,0800,0000,1067 :2246
:2247
U 1066, 0F00,003C,0180,0800,0000,1067 :2248
U 1067, 0000,003C,01F8,0800,0084,71FF :2249
U 11FF, 0D00,003C,0180,0800,0000,1200 :2250
U 1200, 0001,003C,0180,09E8,0000,1201 :2251
U 1201, 0000,003C,0180,0A70,0000,1202 :2252
U 1202, 0000,003C,0180,52F8,0000,1203 :2253
U 1203, 0001,003C,0180,09D0,0000,1204 :2254
U 1204, 0000,003C,75F0,2C00,0000,1205 :2255
U 1205, 0800,003C,0180,0A78,0000,1206 :2256
U 1206, 0003,003C,0180,0AF8,0000,1207 :2257
U 1207, 0001,203C,0180,09E0,0000,1208 :2258
U 1208, 0000,003C,01C0,0A70,0000,1209 :2259
U 1209, 0001,003C,0180,09C8,0000,120A :2260
U 120A, 001D,2000,0180,0800,0010,120B :2261
U 120B, 0000,013C,0180,0800,0000,1068 :2262
U 1068, 0000,003C,0180,0800,0000,1212 :2263
U 1069, 0818,0038,D5F8,0800,0000,120C :2264
U 120C, 0000,003C,0180,0800,0084,720D :2265
U 120D, 0D10,0038,01C0,0960,0000,120E :2266
U 120E, 001D,2034,01C0,0800,0000,120F :2267
U 120F, 0810,0038,0180,0968,0000,1210 :2268
U 1210, 001D,2000,0180,0800,0010,1211 :2269
U 1211, 0000,013C,0180,0800,0000,106A :2270
U 106A, 0000,003E,0180,0800,0000,0002 :2271
U 106B, 0810,003A,0180,0950,0000,0003 :2272
U 1212, 0000,003C,79F0,2C00,0000,1213 :2273
U 1213, 0001,203E,0180,09E8,0000,0001 :2274

:2275
:2276
:2277
:2278
:2279
:2280
:2281
:2282
:2283
:2284
:2285
:2286
:2287
:2288
:2289
:2290
:2291
:2292
:2293
:2294
:2295
:2296
:2297
:2298
:2299
:2300

J/READ
=0
RMOM1: D 0,J/READ
READ: SC_K[.8],Q_0 ; CALCULATE THE EXPECTED HIT/MISS BITS
      D_BAL.SC
      RC[OD] D
      LAB RC[OE]
      RC[OF] LA,FS/MCT,MCT/READ.V.WCHK
      RC[OA] D
      Q_ID[MAINT]
      D_RC[OF]
      RC[OF] 0
      RC[OC] Q
      Q_RC[OE]
      RC[9] D
      ALU_Q=D,CLK.UBCC
      Z?
=0
J/RERR
Q 0,D_K[.6]
SC_K[.8]
D_BAL.SC,Q_RC[OC]
ALU_Q[AND]D,Q_ALU
D RC[OD]
ALU_Q=D,CLK.UBCC
Z?
=0
RETURN2
D_RC[OA],RETURN3
RERR: Q_ID[PARITY]
      RC[OD] Q,RETURN1
; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
; ELSE RETURN2.
WRITE: LAB RC[OE]
      RC[OF] LA,FS/MCT,MCT/WRITE.V.WCHK
      D RC[OF]
      RC[OF] 0
      Q_RC[OE]
      ALU_Q=D,CLK.UBCC
      Z?
=0
J/RERR ; UTRAPPED.
RETURN2 ; OK NO UTRAP.
; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
S1: SC_K[.C]
      ALU D,ORNOT.MASK,D,ALU
      ID[MAINT] D,RETURN1
; SET FORCE REPLACE GROUP ZERO BIT
ROS: D 0
S2: SC_K[.F]
      SC-SC-K[.1]
S3: ALU D,ORNOT.MASK,D,ALU,J/S1
; SET FORCE REPLACE GROUP T BIT
R1S: D_0

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U 1214, 0000,003C,0180,0A70,0000,1215 :2278
U 1215, 0000,003C,0180,32F8,0000,1216 :2279
U 1216, 0800,003C,0180,0A78,0000,1217 :2280
U 1217, 0003,003C,0180,0AF8,0000,1218 :2281
U 1218, 0000,003C,01C0,0A70,0000,1219 :2282
U 1219, 001D,2000,0180,0800,0010,121A :2283
U 121A, 0000,013C,0180,0800,0000,106C :2284
U 106C, 0000,003C,0180,0800,0000,1212 :2285
U 106D, 0000,003E,0180,0800,0000,0002 :2286
:2287
:2288
:2289
:2290
:2291
:2292
:2293
:2294
:2295
:2296
:2297
:2298
:2299
:2300
U 121B, 0000,003C,8580,0800,0084,721C :2291
U 121C, 0801,001C,0180,0800,0000,121D :2292
U 121D, 0000,003E,7580,3C00,0000,0001 :2293
:2294
:2295
:2296
:2297
:2298
:2299
:2300
U 121E, 0F00,003C,0180,0800,0000,121F :2295
U 121F, 0000,003C,6180,0800,0084,7220 :2296
U 1220, 0000,003C,0580,0800,0084,B221 :2297
U 1221, 0801,001C,0180,0800,0000,121B :2298
:2299
:2300
U 1222, 0F00,003C,0180,0800,0000,1223 :2300

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U 1223, 0000,003C,8980,0800,0084,7221	:2301	S4: SC K[D],J/S3
	:2302	; SET FORCE MISS GROUP 0 BIT
U 1224, 0F00,003C,0180,0800,0000,1225	:2303	M0S: D 0
U 1225, 0000,003C,6580,0800,0084,7221	:2304	S5: SC K[10],J/S3
	:2305	; SET FORCE MISS GROUP 1 BIT
U 1226, 0F00,003C,0180,0800,0000,1227	:2306	M1S: D 0
U 1227, 0000,003C,6180,0800,0084,7221	:2307	S6: SC K[F],J/S3
	:2308	; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 1228, 0F00,003C,0180,0800,0000,1229	:2309	M10S: D 0
U 1229, 0000,003C,6180,0800,0084,722A	:2310	SC K[F]
U 122A, 0801,001C,0180,0800,0000,1225	:2311	S7: ALU D,ORNOT.MASK,D,ALU,J/S5
	:2312	; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 122B, 0F00,003C,0180,0800,0000,122C	:2313	ROM1S: D 0
U 122C, 0000,003C,6180,0800,0084,722D	:2314	SC K[F]
U 122D, 0801,001C,0180,0800,0000,121F	:2315	ALU D,ORNOT.MASK,D,ALU,J/S2
	:2316	; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 122E, 0F00,003C,8980,0800,0084,722A	:2317	R1M0S: D_0,SC_K[D],J/S7


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:2318 .PAGE "TEST FO INCREMENT VIBA FUNCTION TEST"
:2319 *****
:2320 ++
:2321 TEST FO INCREMENT VIBA FUNCTION TEST
:2322
:2323 TEST DESCRIPTION
:2324 THIS IS A TEST OF THE INCREMENT VIBA FUNCTION.
:2325
:2326 LOGIC DESCRIPTION
:2327 THIS TESTS LOGIC ON THE TBM, SBL, IDP AND
:2328 DATA PATH MODULES
:2329
:2330 ERROR DESCRIPTION
:2331 EXPECTED VIBA
:2332 GOT VIBA
:2333 VIBA BEFORE INCREMENT
:2334
:2335 --
:2336 *****
:2337 =0
:2338 INCIVA: NEWTST
:2339 D 0,IBC/STOP ; TURN OFF IB
:2340 =0 ID[IBERO] D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
:2341 ALU 0-K[1],D,ALU ; GENERATE A MASK
:2342 D D,LEFT2,SI/ZERO
:2343 R[1] D ; R[1]=FFFFFFFC
:2344 D K[1E]
:2345 ALU D-K[1],R[2],ALU ; SET UP A COUNTER, R[2]=1D
:2346 RC[0F] K[3]
:2347 =0 ERLOOP
:2348 INCVA1: VA K[ZERO] ; INVALIDATE LOCATION 0
:2349 FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
:2350 VA VA+4 ; INVALIDATE LOCATION 4
:2351 FS7MCT,MCT/INVALIDATE ; OF BOTH GROUPS
:2352 =0 CALL J/ROS ; SET FORCE REPLACE GROUP 0 BIT
:2353 VA K[ZERO],D 0 ; WRITE DATA=00000000 INTO LOCATION 0
:2354 FS7MCT,MCT/VALIDATE ; OF GROUP 0
:2355 VA VA+4 ; WRITE DATA=00000000 INTO LOCATION 4
:2356 FS7MCT,MCT/VALIDATE ; OF GROUP 0
:2357 SC R[2] ; COMPUTE TEST OPERAND
:2358 SC SC+K[2],D R[1]
:2359 ALU D,AND,MASK,R[0],ALU,D,ALU,IBC/FLUSH ; LOAD VIBA
:2360 RC[0C] D
:2361 VA K[ZERO] ; LOAD 0 INTO IPA
:2362 FS7MCT,MCT/READ.V.NEWPC
:2363 IBC/START ; START IB REFERENCES
:2364 FS7MCT,MCT/ALLOW.IB.READ ; ALLOW IB READS TO GET VIBA INCREMENT
:2365 IBC/STOP ; STOP IB
:2366 PCK/PC,IBA ; LOAD VIBA INTO PC
:2367 ALU PC,RC[0D],ALU,Q,ALU ; GET RESULT FROM PC
:2368 D R[0]
:2369 ALU D+K[4],RC[0E],ALU,D,ALU ; COMPUTE EXPECTED RESULT
:2370 ALU Q-D,CLK,UBCC ; WAS THE RESULT CORRECT?
:2371 Z?
:2372 =0 ERROR1 ; INCREMENT VIBA FUNCTION FAILED

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U 106E, 0000,003D,0180,0800,0000,116E
U 106F, 1F00,003C,0180,0800,0000,1070
U 1070, 0000,003D,4980,3C00,0000,1192
U 1071, 081B,0000,0580,0800,0000,122F
U 122F, 0100,003C,0180,0800,0000,1230
U 1230, 0001,003C,0180,0A88,0000,1231
U 1231, 081B,0038,5180,0800,0000,1232
U 1232, 0019,0000,0580,0A90,0000,1233
U 1233, 0018,0038,0D80,09F8,0000,1072
U 1072, 0000,003D,0180,0800,0000,1181
U 1073, 0018,0038,1980,0800,0200,1234
U 1234, 0000,003C,0180,9000,0000,1235
U 1235, 0000,003C,0180,0803,0000,1236
U 1236, 0000,003C,0180,9000,0000,1074
U 1074, 0000,003D,0180,0800,0000,121E
U 1075, 0F18,0038,1980,0800,0200,1237
U 1237, 0000,003C,0180,9800,0000,1238
U 1238, 0000,003C,0180,0803,0000,1239
U 1239, 0000,003C,0180,9800,0000,123A
U 123A, 0000,003C,0180,0A10,0082,123B
U 123B, 0800,003C,0980,0A08,0084,923C
U 123C, 2801,0034,0180,0A80,0000,123D
U 123D, 0001,003C,0180,09E0,0000,123E
U 123E, 0018,0038,1980,0800,0200,123F
U 123F, 0000,003C,0180,6000,0000,1240
U 1240, 3000,003C,0180,0800,0000,1241
U 1241, 0000,003C,0180,F800,0000,1242
U 1242, 1000,003C,0180,0800,0000,1243
U 1243, 0000,003C,0180,0802,0000,1244
U 1244, 0014,0038,01C0,09E8,0000,1245
U 1245, 0800,003C,0180,0A00,0000,1246
U 1246, 0819,0014,1180,09F0,0000,1247
U 1247, 001D,2000,0180,0800,0010,1248
U 1248, 0000,013C,0180,0800,0000,1076
U 1076, 0000,003D,0180,0800,0000,1182

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N 11

NEW

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U 1077, 0000,003C,0180,0A10,0010,1249      ;2373      ALU_R[2],CLK.UBCC      ; HAVE ALL TEST PATTERNS BEEN TRIED
U 1249, 0000,013C,0180,0800,0000,1078      ;2374      Z?
U 1078, 0018,0000,0580,0A90,0000,1073      ;2375      R[2]_LA-K[.1],J/INCVA1      ; IF NOT CONTINUE
U 1079, 0000,003C,0180,0800,0000,107A      ;2376      NOP

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:2377 .PAGE "TEST F1 INCREMENT IPA FUNCTION TEST"
:2378 *****
:2379 ++
:2380 TEST F1 INCREMENT IPA FUNCTION TEST
:2381
:2382 TEST DESCRIPTION
:2383 THIS IS A TEST OF THE INCREMENT IPA FUNCTION.
:2384
:2385 LOGIC DESCRIPTION
:2386 THIS IS A TEST OF LOGIC ON TBM
:2387
:2388 ERROR DESCRIPTION
:2389 EXPECTED IPA
:2390 GOT IPA
:2391 IPA BEFORE INCREMENT
:2392
:2393 --
:2394 *****
:2395 =0
:2396 INCIPA: NEWTST
:2397 D 0,IBC/STOP ; TURN OFF IB
:2398 =0 ID[IBERO]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
:2399 D_K[.7F]
:2400 D_D.LEFT2,SI/ZERO
:2401 R[1]_D ; R[1]=1FC, A MASK USED TO GENERATE TEST PATTERNS
:2402 R[2]_K[.6] ; INITIALIZE A TEST PATTERN COUNTER
:2403 RC[0F]_K[.3]
:2404 =0 ERLOOP
:2405 INCIPA1: ALU 0(K),IBC/FLUSH ; CLEAR IB AND LOAD 0 INTO VIBA
:2406 SC R[2] ; GENERATE TEST PATTERN FOR IPA
:2407 SC-SC+K[.2],D R[1]
:2408 ALU D.AND.MASK,R[0]_ALU,VA_ALU,D_ALU ; PUT TEST PATTERN INTO VA
:2409 RC[0C]_D
:2410 =0 FS/MCT,MCT/INVALIDATE ; INVALIDATE THIS LOCATION IN BOTH GROUPS
:2411 CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
:2412 D 0 ; WRITE DATA=00000000 AT TEST ADDRESS
:2413 FS/MCT,MCT/VALIDATE ; IN GROUP 0
:2414 FS/MCT,MCT/READ.V.NEWPC ; LOAD THE IPA
:2415 IBC/START ; START IB CYCLES
:2416 FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB TO READ SO THAT THE INCREMENT IPA FUNCTI
:2417 IBC/STOP ; STOP IB
:2418 FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB READ TO GET RESULT
:2419 Q_ID[TIME.ADDR] ; GET IPA FROM TIME OUT ADDRESS REG
:2420 Q-Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS CORRECTLY IN Q
:2421 Q-Q.LEFT,SI/ZERO
:2422 Q-Q.RIGHT,SI/ZERO
:2423 RC[0D]_Q
:2424 D R[0] ; COMPUTE EXPECTED RESULT
:2425 ACU D+K[.4],D ALU,RC[0E]_ALU
:2426 ALU-Q-D.CLK.UBCC ; WAS RESULT CORRECT?
:2427 Z?
:2428 =0 ERROR1 ; INCREMENT IPA FUNCTION FAILED
:2429 ALU_R[2],CLK.UBCC ; HAVE ALL TEST PATTERNS BEEN TRIED?
:2430 Z?
:2431 =0 R[2]_LA-K[.1],J/INCPA1 ; IF NOT CONTINUE

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U 107A, 0000,003D,0180,0800,0000,116E
U 107B, 1F00,003C,0180,0800,0000,107C
U 107C, 0000,003D,4980,3C00,0000,1192
U 107D, 0818,0038,5980,0800,0000,124A
U 124A, 0100,003C,0180,0800,0000,124B
U 124B, 0001,003C,0180,0A88,0000,124C
U 124C, 0018,0038,D580,0A90,0000,124D
U 124D, 0018,0038,0D80,09F8,0000,107E
U 107E, 0000,003D,0180,0800,0000,1181
U 107F, 2018,0038,1980,0800,0000,124E
U 124E, 0000,003C,0180,0A10,0082,124F
U 124F, 0800,003C,0980,0A08,0084,9250
U 1250, 0801,0034,0180,0A80,0200,1251
U 1251, 0001,003C,0180,09E0,0000,1252
U 1252, 0000,003C,0180,9000,0000,1080
U 1080, 0000,003D,0180,0800,0000,121E
U 1081, 0F00,003C,0180,0800,0000,1253
U 1253, 0000,003C,0180,9800,0000,1254
U 1254, 0000,003C,0180,6000,0000,1255
U 1255, 3000,003C,0180,0800,0000,1256
U 1256, 0000,003C,0180,F800,0000,1257
U 1257, 1000,003C,0180,0800,0000,1258
U 1258, 0000,003C,0180,F800,0000,1259
U 1259, 0000,003C,69F0,2C00,0000,125A
U 125A, 0000,003C,0188,0800,0000,125B
U 125B, 0000,003C,01A8,0800,0000,125C
U 125C, 0000,003C,01B0,0800,0000,125D
U 125D, 0001,203C,0180,09E8,0000,125E
U 125E, 0800,003C,0180,0A00,0000,125F
U 125F, 0819,0014,1180,09F0,0000,1260
U 1260, 001D,2000,0180,0800,0010,1261
U 1261, 0000,013C,0180,0800,0000,1082
U 1082, 0000,003D,0180,0800,0000,1182
U 1083, 0000,003C,0180,0A10,0010,1262
U 1262, 0000,013C,0180,0800,0000,1084
U 1084, 0018,0000,0580,0A90,0000,107F

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ZZ-ESKAH-V132 TEST F1 INCREMENT IPA FUNCTION TEST
ESKAH32.MCR MICRO2 1M(01) 16-DEC-82 11:59:02

C 12

SEQ 0759
Page 6

U 1085, 0000,003C,0180,0800,0000,1086 ;2432 NOP


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U 1086, 0000,003D,0180,0800,0000,116E
U 1087, 1F00,003C,0180,0800,0000,1088
U 1088, 0000,003D,4980,3C00,0000,1192
U 1089, 0818,0038,5980,0800,0000,1263
U 1263, 0100,003C,0180,0800,0000,1264
U 1264, 0001,003C,0180,0A80,0000,108A
U 108A, 0818,0001,0580,0800,0000,11E5
U 108B, 0200,003C,0180,0800,0000,1265
U 1265, 0001,003C,0180,0A88,0000,1266
U 1266, 0018,0038,8D80,0A90,0000,1267
U 1267, 0018,0038,0580,09E0,0000,1268
U 1268, 0018,0038,1180,09F8,0000,108C
U 108C, 0000,003D,0180,0800,0000,1181
U 108D, 0000,003C,0180,0A10,0082,1269
U 1269, 0800,0034,0180,0A08,0000,126A
U 126A, 0001,003C,0180,0AA8,0000,126B
U 126B, 2019,0000,1180,0800,0000,126C
U 126C, 0000,003C,0180,0A00,0200,126D
U 126D, 0000,003C,0180,9000,0000,108E
U 108E, 0000,003D,0180,0800,0000,121E
U 108F, 0F00,003C,0180,0800,0000,126E
U 126E, 0000,003C,0180,9800,0000,126F
U 126F, 0000,003C,0180,6000,0000,1270
U 1270, 0018,0038,1980,0800,0200,1271
U 1271, 3000,003C,0180,0800,0000,1272
U 1272, 0000,003C,0180,F800,0000,1273
U 1273, 0000,003C,0180,F800,0000,1274
U 1274, 1000,003C,0180,F800,0000,1275
U 1275, 0000,003C,0180,F800,0000,1276
U 1276, 0000,003C,69F0,2C00,0000,1277
U 1277, 0000,003C,0188,0800,0000,1278
U 1278, 0000,003C,01A8,0800,0000,1279
U 1279, 0000,003C,01B0,0800,0000,127A
U 127A, 0001,203C,0180,09E8,0000,127B
U 127B, 0000,003C,4DF0,2C00,0000,127C

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.PAGE "TEST F2 AUTO RELOAD TEST 1"
*****
++
TEST F2 AUTO RELOAD TEST 1

TEST DESCRIPTION
THIS IS A TEST OF AUTO RELOAD WITH THE TB OFF (MME=0).

LOGIC DESCRIPTION
LOGIC ON TBM, DDP, AND DEP IS TESTED HERE

ERROR DESCRIPTION
EXPECTED IPA
GOT IPA
EXPECTED TBER1
GOT TBER1
--
*****
=0
ARO: NEWTST
D 0,IBC/STOP ; TURN IB OFF
=0 ID[TBER0],D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
D K[7F] ; GENERATE ADDRESS WHICH ILL RESULT
D D.LEFT2,SI/ZERO ; IN AN AUTO RELOAD IF PUT IN IPA AND INCREMENTED
R[0] D ; R[0]=1FC
=0 ALU 0-K[1],D,ALU,CALL,J/DCO ; GENERATE A MASK USED TO CALCULATE
D D.RIGHT2,SI/ZERO ; TEST PATTERNS
R[1] D ; R[1]=3FFFFFFC
R[2]-K[1F] ; TEST PATTERN COUNTER
R[0C]-K[1]
R[0F]-K[4]
=0 ERLOOP
AROA: SC R[2] ; GENERATE TEST PATTERN
ALD R[1],AND,MASK,D_ALU ; PATTERN IS A 0 IN 1'S
R[5] D
ALU 0-K[4],IBC/FLUSH ; DECREMENT TEST PATTERN BY FOR AND LOAD VIBA
VA R[0] ; LOAD 1FC INTO VA
FS/MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D 0 ; WRITE DATA=00000000 INTO LOCATION 1FC
FS/MCT,MCT/VALIDATE ; OF GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA K[ZERO] ; CLEAR VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 REFERENCE TO GET IPA INCREMENT AND AU
FS/MCT,MCT/ALLOW.IB.READ
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; TURN OFF IB
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET IPA FROM TIME OUT ADDRESS REG
Q-Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS PROPERLY IN Q
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
R[0D] Q
Q_ID[TBER1] ; READ TBER1 TO LOOK AT AUTO RELOAD BIT

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U 127C, 0001,203C,0180,09D8,0000,127D :2488
U 127D, 0800,003C,0180,0A28,0000,127E :2489
U 127E, 080D,0024,0180,0A00,0000,127F :2490
U 127F, 0001,003C,0180,09F0,0000,1280 :2491
U 1280, 0010,0038,01C0,0968,0000,1281 :2492
U 1281, 001D,2000,0180,0800,0010,1282 :2493
U 1282, 0000,013C,0180,0800,0000,1090 :2494
U 1090, 0000,003D,0180,0800,0000,1182 :2495
U 1091, 0810,0038,0180,0958,0000,1283 :2496
U 1283, 0819,0034,0580,0800,0000,1284 :2497
U 1284, 0019,0000,0580,0800,0010,1285 :2498
U 1285, 0000,013C,0180,0800,0000,1092 :2499
U 1092, 0000,003D,0180,0800,0000,1182 :2500
U 1093, 0000,003C,0180,0A10,0082,1286 :2501
U 1286, 0800,0024,0180,0A08,0000,1287 :2502
U 1287, 0001,003C,0180,0AA8,0000,1288 :2503
U 1288, 2019,0000,1180,0800,0000,1289 :2504
U 1289, 0000,003C,0180,0A00,0200,128A :2505
U 128A, 0000,003C,0180,9000,0000,1094 :2506
U 1094, 0000,003D,0180,0800,0000,121E :2507
U 1095, 0F00,003C,0180,0800,0000,128B :2508
U 128B, 0000,003C,0180,9800,0000,128C :2509
U 128C, 0000,003C,0180,6000,0000,128D :2510
U 128D, 0018,0038,1980,0800,0200,128E :2511
U 128E, 3000,003C,0180,0800,0000,128F :2512
U 128F, 0000,003C,0180,F800,0000,1290 :2513
U 1290, 0000,003C,0180,F800,0000,1291 :2514
U 1291, 1000,003C,0180,F800,0000,1292 :2515
U 1292, 0000,003C,0180,F800,0000,1293 :2516
U 1293, 0000,003C,69F0,2C00,0000,1294 :2517
U 1294, 0000,003C,0188,0800,0000,1295 :2518
U 1295, 0000,003C,01A8,0800,0000,1296 :2519
U 1296, 0000,003C,01B0,0800,0000,1297 :2520
U 1297, 0001,203C,0180,09E8,0000,1298 :2521
U 1298, 0000,003C,4DF0,2C00,0000,1299 :2522
U 1299, 0001,203C,0180,09D8,0000,129A :2523
U 129A, 0800,003C,0180,0A28,0000,129B :2524
U 129B, 080D,0024,0180,0A00,0000,129C :2525
U 129C, 0001,003C,0180,09F0,0000,129D :2526
U 129D, 0010,0038,01C0,0968,0000,129E :2527
U 129E, 001D,2000,0180,0800,0010,129F :2528
U 129F, 0000,013C,0180,0800,0000,1096 :2529
U 1096, 0000,003D,0180,0800,0000,1182 :2530
U 1097, 0810,0038,0180,0958,0000,12A0 :2531
U 12A0, 0819,0034,0580,0800,0000,12A1 :2532
U 12A1, 0019,0000,0580,0800,0010,12A2 :2533
U 12A2, 0000,013C,0180,0800,0000,1098 :2534
U 1098, 0000,003D,0180,0800,0000,1182 :2535
U 1099, 0000,003C,0180,0A10,0010,12A3 :2536
U 12A3, 0000,013C,0180,0800,0000,109A :2537
U 109A, 0018,0000,0580,0A90,0000,108D :2538
U 109B, 0000,003C,0180,0800,0000,109C :2539

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=0

=0

=0

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```

RC[OB]_Q
D RC[5] ; SEE IF IPA WAS RELOADED FROM VIBA
LAB RC[0],ALU_D[ANDNOT]LB,D_ALU
RC[OE]_D
Q RC[OB]
ALU_Q-D,CLK.UBCC
Z?
ERROR1 ; IPA INCORRECT AFTER AUTO RELOAD
D RC[OB] ; SEE IF TBER1 CORRECT AFTER AUTO RELOAD
ALU_D[AND]K[.1],D_ALU
ALU_D-K[.1],CLK.UBCC
Z?
ERROR1 ; TBER1 INCORRECT AFTER AUTO RELOAD
SC RC[2] ; NOW USE 1 IN 0'S TEST PATTERN
ALD RC[1].ANDNOT.MASK,D_ALU ; GENERATE TEST PATTERN
RC[5]_D
ALU_D-K[.4],IBC/FLUSH ; LOAD TEST PATTERN MINUS 4 INTO VIBA
VA RC[0] ; LOAD 1FC INTO VA
FS/MCT,MCT/INVALIDATE ; INVALIDATE IFC IN BOTH GROUPS
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D 0 ; WRITE DATA=00000000 INTO LOCATION 1FC
FS/MCT,MCT/VALIDATE ; OF GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA K[ZERO] ; CLEAR VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB TO DO 1 READ SO
FS/MCT,MCT/ALLOW.IB.READ ; THAT IPA GETS INCREMENTED AND
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOAD OCCURS
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET RESULTANT IPA FROM TIME OUT ADDRESS REG
Q-Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS IN Q PROPERLY
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
RC[OD]_Q
Q_ID[TBER1] ; GET TBER1 TO TEST AUTO RELOAD BIT
RC[OB]_Q
D RC[5] ; SEE IF IPA WAS CORRECT AFTER AUTO RELOAD
LAB RC[0],ALU_D[ANDNOT]LB,D_ALU
RC[OE]_D
Q RC[OB]
ALU_Q-D,CLK.UBCC
Z?
ERROR1 ; IPA INCORRECT AFTER AUTO RELOAD
D RC[OB] ; CHECK AUTO RELOAD BIT IN TBER1
ALU_D[AND]K[.1],D_ALU
ALU_D-K[.1],CLK.UBCC
Z?
ERROR1 ; AUTO RELOAD BIT IN TBER1 INCORRECT
ALU_R[2],CLK.UBCC ; SEE IF ALL TEST PATTERN HAVE BEEN TRIED
Z?
RC[2]_LA-K[.1],J/AROA ; IF NOT CONTINUE
NOP

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U 109C, 0000,003D,0180,0800,0000,116E
U 109D, 1F18,0038,D580,09F8,0000,109E
U 109E, 0000,003D,4980,3C00,0000,1192
U 109F, 0818,0038,5980,0800,0000,12A4
U 12A4, 0100,003C,0180,0800,0000,12A5
U 12A5, 0001,003C,0180,0A80,0000,10A0
U 10A0, 081B,0001,0580,0800,0000,11ED
U 10A1, 0600,003C,0180,0800,0000,12A6
U 12A6, 0001,003C,0180,0A88,0000,12A7
U 12A7, 0018,0038,8D80,0A90,0000,12AB
U 12AB, 0818,0038,0580,09E0,0000,10A2
U 10A2, 0000,003D,0180,0800,0000,11C3
U 10A3, 0818,0038,C180,0800,0000,12A9
U 12A9, 0600,003C,0180,0800,0000,12AB
U 12AB, 0041,0028,0180,0AA0,0000,10A4
U 10A4, 0000,003D,0180,0800,0000,1181
U 10A5, 0F03,003C,0180,09C8,0000,12AC
U 12AC, 0000,003C,4980,3C00,0000,12AD
U 12AD, 0000,003C,0180,0A10,0082,12AE
U 12AE, 0800,0034,0180,0A08,0000,12AF
U 12AF, 0001,003C,0180,09D0,0000,12B0
U 12B0, 0001,003C,0180,0AA8,0000,12B1
U 12B1, 2019,0000,1180,0800,0000,12B2
U 12B2, 0000,003C,0180,0A00,0200,12B3
U 12B3, 0000,003C,0180,9000,0000,10A6
U 10A6, 0000,003D,0180,0800,0000,121E
U 10A7, 0F00,003C,0180,0800,0000,12B4
U 12B4, 0000,003C,0180,9800,0000,12B5
U 12B5, 0000,003C,0180,6000,0000,12B6
U 12B6, 0000,003C,0180,0A28,0200,12B7

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.PAGE "TEST F3 AUTO RELOAD TEST 2"
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++
TEST F3 AUTO RELOAD TEST 2

TEST DESCRIPTION
THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
THE VIBA BEING A HIT IN TB GROUP ZERO AND MME=1

LOGIC DESCRIPTION
LOGIC ON TBM AND DEP IS TESTED HERE

ERROR DESCRIPTION
EXPECTED IPA
GOT IPA
EXPECTED TBER1
GOT TBER1
VIBA USED IN AUTO RELOAD
ERROR CODE : (FOR FAILCHAIN)
0=> FAILED WITH "ORIGINAL" ADDRESS PATTERN
1=> FAILED WITH COMPLEMENT ADDRESS PATTERN
--
*****
=0
AR1: NEWTST
D 0,IBC/STOP,RC[0F],K[.6] ; TURN IB OFF
=0 ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI OFF
D_K[.7F] ; GENERATE ADDRESS WHICH WILL
D-D.LEFT2,SI/ZERO ; CAUSE AUTO RELOAD WHEN LOADED
R[0]_D ; R[0]=1FC
=0 ALU_D-K[.1],D,ALU,CALL,J/DCB ; MASK TO GENERATE TEST DATA
D-D.RIGHT,SI/ZERO
R[1]_D ; R[1]=7FFFFFFC
R[2]_K[.1F] ; DATA PATTERN COUNTER
RC[0C]_K[.1],D_K[.1]
=0 CALL,J7TBWPTP ; GET TEST PATTERNS
D_K[.FFFF]
D-D.RIGHT,SI/ZERO
A[U NOT.D,R[4]_ALU.RIGHT,SI/ZERO ; R[4]=7FFFC000
=0 ERLDOP
AR1A: D 0,RC[9]_0 ; TURN TB OFF
ID[TBER0]_D
SC_R[2] ; VIBA
ALU_R[1].AND.MASK,D_ALU
RC[0A]_D
R[5]_D
ALU_D-K[.4],IBC/FLUSH ; SET UP VIBA
VA_R[0] ; SET VA=1FC
FS7MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D 0 ; WRITE DATA=00000000 INTO LOCATION 1FC
FS/MCT,MCT/VALIDATE ; OF GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA_R[5] ; MAKE VIBA A HIT IN BOTH TB GROUPS

```



```

U 12B7. 0000,003C,0180,0900,0000,10A8 :2595
U 10A8. 0010,0039,0180,0AC0,0000,1014 :2596
U 10A9. 0800,003C,0180,0A28,0000,12B8 :2597
U 12B8. 0000,0020,0180,0A20,0200,12B9 :2598
U 12B9. 0000,003C,0180,0918,0000,10AA :2599
U 10AA. 0010,0039,0180,0AC0,0000,100C :2600
U 10AB. 0018,0038,1980,0800,0200,12BA :2601
U 12BA. 3000,003C,0180,0800,0000,12BB :2602
U 12BB. 0000,003C,0180,F800,0000,12BC :2603
U 12BC. 0000,003C,0180,F800,0000,12BD :2604
U 12BD. 1000,003C,0180,F800,0000,12BE :2605
U 12BE. 0000,003C,0180,F800,0000,12BF :2606
U 12BF. 0000,003C,69F0,2C00,0000,12C0 :2607
U 12C0. 0000,003C,0188,0800,0000,12C1 :2608
U 12C1. 0000,003C,01A8,0800,0000,12C2 :2609
U 12C2. 0000,003C,0180,0800,0000,12C3 :2610
U 12C3. 0001,203C,0180,09E8,0000,12C4 :2611
U 12C4. 0000,003C,4DF0,2C00,0000,12C5 :2612
U 12C5. 0001,203C,0180,09D8,0000,12C6 :2613
U 12C6. 0810,0038,0180,0910,0000,12C7 :2614
U 12C7. 0100,003C,0180,0800,0000,12C8 :2615
U 12C8. 0001,003C,0180,09F0,0000,12C9 :2616
U 12C9. 0010,0038,01C0,0968,0000,12CA :2617
U 12CA. 0010,2000,0180,0800,0010,12CB :2618
U 12CB. 0000,013C,0180,0800,0000,10AC :2619
U 10AC. 0000,003D,0180,0800,0000,1182 :2620

U 10AD. 0810,0038,0180,0958,0000,12CC :2622
U 12CC. 0819,0034,0580,0800,0000,12CD :2623
U 12CD. 0019,0000,0580,0800,0010,12CE :2624
U 12CE. 0000,013C,0180,0800,0000,10AE :2625
U 10AE. 0000,003D,0180,0800,0000,1182 :2626
U 10AF. 0F18,0038,0580,09C8,0000,12CF :2627
U 12CF. 0000,003C,4980,3C00,0000,12D0 :2628
U 12D0. 0000,003C,0180,0A10,0082,12D1 :2629
U 12D1. 0800,0024,0180,0A08,0000,12D2 :2630
U 12D2. 0001,003C,0180,09D0,0000,12D3 :2631
U 12D3. 0001,003C,0180,0AA8,0000,12D4 :2632
U 12D4. 2019,0000,1180,0800,0000,12D5 :2633
U 12D5. 0000,003C,0180,0A00,0200,12D6 :2634
U 12D6. 0000,003C,0180,9000,0000,10B0 :2635
U 10B0. 0000,003D,0180,0800,0000,121E :2636
U 10B1. 0F00,003C,0180,0800,0000,12D7 :2637
U 12D7. 0000,003C,0180,9800,0000,12D8 :2638
U 12D8. 0000,003C,0180,6000,0000,12D9 :2639
U 12D9. 0000,003C,0180,0A28,0200,12DA :2640
U 12DA. 0000,003C,0180,0918,0000,10B2 :2641
U 10B2. 0010,0039,0180,0AC0,0000,1014 :2642
U 10B3. 0800,003C,0180,0A28,0000,12DB :2643
U 12DB. 0000,0020,0180,0A20,0200,12DC :2644
U 12DC. 0000,003C,0180,0900,0000,10B4 :2645
U 10B4. 0010,0039,0180,0AC0,0000,100C :2646
U 10B5. 0018,0038,1980,0800,0200,12DD :2647
U 12DD. 3000,003C,0180,0800,0000,12DE :2648
U 12DE. 0000,003C,0180,F800,0000,12DF :2649

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LC RC[0]
R[8] LC,CALL,J/TBWRB
D RC[5] ; MAKE VIBA A MISS IN TB GROUP 1
LAB RC[4],ALU_D[XOR]LB,VA_ALU
LC RC[3]
R[8] LC,CALL,J/TBWR1
VA K[ZERO] ; CLEAR VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 READ WHICH
FS/MCT,MCT/ALLOW.IB.READ ; WILL CAUSE INCREMENT IPA AND
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOAD
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET NEW IPA FROM TIME OUT ADDRESS REG
Q-Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS IN Q PROPERLY
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
RC[0D] Q
Q_ID[TBER1] ; GET TBER1 TO CHECK AUTO RELOAD BIT
RC[0B] Q
D RC[2] ; SEE IF VIBA WAS RELOCATED
D-D.LEFT2,SI/ZERO ; PROPERLY THRU TB GROUP 0
RC[0E] D ; WHEN THE AUTO RELOAD OCCURRED
Q RC[0B]
ALU_Q-D,CLK.UBCC
Z?
ERROR1 ; IPA INCORRECT AFTER AUTO RELOADED
; FROM TB GROUP 0
D RC[0B] ; CHECK THE AUTO RELOAD
ALU_D[AND]K[.1],D_ALU ; BIT IN TBER1
ALU_D-K[.1],CLK.UBCC
Z?
ERROR1 ; TBER1 AUTO RELOAD BIT NOT SET
D 0,RC[9]_K[.1] ; NOW USE COMPLEMENT TEST PATTERN
ID[TBER0]_D ; TURN OFF TB
SC RC[2] ; GENERATE VIBA VALUE
ALD RC[1].ANDNOT.MASK,D_ALU
RC[0A]_D
RC[5] D
ALU_D-K[.4],IBC/FLUSH ; LOAD TEST PATTERN INTO VIBA
VA RC[0] ; LOAD VA=1FC
FS/MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D 0 ; WRITE DATA=00000000 INTO LOCATION
FS/MCT,MCT/VALIDATE ; 1FC OF GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA RC[5] ; MAKE VIBA A HIT IN BOTH TB GROUPS
LC RC[3]
R[8] LC,CALL,J/TBWRB
D RC[5] ; MAKE VIBA A MISS IN TB GROUP 1
LAB RC[4],ALU_D[XOR]LB,VA_ALU
LC RC[0]
R[8] LC,CALL,J/TBWR1
VA K[ZERO] ; CLEAR VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 READ WHICH WILL

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U 12DF, 0000,003C,0180,F800,0000,12E0 :2650
U 12E0, 1000,003C,0180,F800,0000,12E1 :2651
U 12E1, 0000,003C,0180,F800,0000,12E2 :2652
U 12E2, 0000,003C,69F0,2C00,0000,12E3 :2653
U 12E3, 0000,003C,0188,0800,0000,12E4 :2654
U 12E4, 0000,003C,01A8,0800,0000,12E5 :2655
U 12E5, 0000,003C,01B0,0800,0000,12E6 :2656
U 12E6, 0001,203C,0180,09E8,0000,12E7 :2657
U 12E7, 0000,003C,4DF0,2C00,0000,12E8 :2658
U 12E8, 0001,203C,0180,09D8,0000,12E9 :2659
U 12E9, 0810,0038,0180,0928,0000,12EA :2660
U 12EA, 0100,003C,0180,0800,0000,12EB :2661
U 12EB, 0001,003C,0180,09F0,0000,12EC :2662
U 12EC, 0010,0038,01C0,0968,0000,12ED :2663
U 12ED, 001D,2000,0180,0800,0010,12EE :2664
U 12EE, 0000,013C,0180,0800,0000,10B6 :2665
U 10B6, 0000,003D,0180,0800,0000,1182 :2666
U 10B7, 0810,0038,0180,0958,0000,12EF :2668
U 12EF, 0819,0034,0580,0800,0000,12F0 :2669
U 12F0, 0019,0000,0580,0800,0010,12F1 :2670
U 12F1, 0000,013C,0180,0800,0000,10B8 :2671
U 10B8, 0000,003D,0180,0800,0000,1182 :2672
U 10B9, 0000,003C,0180,0A10,0010,12F2 :2673
U 12F2, 0000,013C,0180,0800,0000,10BA :2674
U 10BA, 0018,0000,0580,0A90,0000,10A5 :2675
U 10BB, 0000,003C,0180,0800,0000,10BC :2676

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=0

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FS/MCT,MCT/ALLOW.IB.READ ; CAUSE THE IPA TO BE INCREMENTED AND
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOADED
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET AUTO RELOADED IPA
Q_Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS IN Q PROPERLY
Q_Q.LEFT,SI/ZERO
Q_Q.RIGHT,SI/ZERO
RC[OD] Q
Q_ID[TBER1] ; GET TBER1 TO CHECK
RC[OB] Q ; AUTO RELOAD BIT
D_RC[5] ; CHECK IPA AUTO RELOADED ADDRESS
D_D.LEFT2,SI/ZERO
RC[OE] D
Q_RC[OD]
ALU_Q-D,CLK.UBCC
Z?
ERROR1 ; IPA INCORRECT AFTER AUTO RELOADED
; FROM GROUP 0
; CHECK AUTO RELOAD BIT IN TBER1
D_RC[OB]
ALU_D[AND]K[.1],D_ALU
ALU_D-K[.1],CLK.UBCC
Z?
ERROR1 ; AUTO RELOAD BIT NOT SET IN TBER1
ALU_R[2],CLK.UBCC ; HAVE ALL TEST PATTERNS BEEN TRIED?
Z?
R[2]_LA-K[.1],J/AR1A ; IF NOT CONTINUE
NOP

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U 10BC, 0000,003D,0180,0800,0000,116E
U 10BD, 1F00,003C,0180,0800,0000,10BE
U 10BE, 0000,003D,4980,3C00,0000,1192
U 10BF, 0818,0038,5980,0800,0000,12F3
U 12F3, 0100,003C,0180,0800,0000,12F4
U 12F4, 0001,003C,0180,0A80,0000,10C0
U 10C0, 0818,0001,0580,0800,0000,11ED
U 10C1, 0600,003C,0180,0800,0000,12F5
U 12F5, 0001,003C,0180,0A88,0000,12F6
U 12F6, 0018,0038,8D80,0A90,0000,12F7
U 12F7, 0818,0038,0580,09E0,0000,12F8
U 12F8, 0019,0014,1180,09F8,0000,10C2
U 10C2, 0000,003D,0180,0800,0000,11C3
U 10C3, 0818,0038,C180,0800,0000,12F9
U 12F9, 0600,003C,0180,0800,0000,12FA
U 12FA, 0041,0028,0180,0AA0,0000,10C4
U 10C4, 0000,003D,0180,0800,0000,1181
U 10C5, 0F00,003C,0180,0800,0000,12FB
U 12FB, 0000,003C,4980,3C00,0000,12FC
U 12FC, 0000,003C,0180,0A10,0082,12FD
U 12FD, 0800,0034,0180,0A08,0000,12FE
U 12FE, 0001,003C,0180,09D0,0000,12FF
U 12FF, 0001,003C,0180,0AA8,0000,1300
U 1300, 2019,0000,1180,0800,0000,1301
U 1301, 0000,003C,0180,0A00,0200,1302
U 1302, 0000,003C,0180,9000,0000,10C6
U 10C6, 0000,003D,0180,0800,0000,121E
U 10C7, 0F00,003C,0180,0800,0000,1303
U 1303, 0000,003C,0180,9800,0000,1304
U 1304, 0000,003C,0180,6000,0000,1305
U 1305, 0000,003C,0180,0A28,0200,1306
U 1306, 0000,003C,0180,0900,0000,10C8
U 10C8, 0010,0039,0180,0AC0,0000,1014
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.PAGE "TEST F4 AUTO RELOAD TEST 3"
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TEST F4 AUTO RELOAD TEST 3

TEST DESCRIPTION
THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
THE VIBA BEING A HIT IN TB GROUP ONE AND MME=1

LOGIC DESCRIPTION
LOGIC ON TBM IS TESTED HERE

ERROR DESCRIPTION
EXPECTED IPA
GOT IPA
EXPECTED TBER1
GOT TBER1
VIBA USED IN AUTO RELOAD
--
*****
=0
AR2: NEWTST
D 0,IBC/STOP ; TURN IB OFF
=0 ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
D_K[.7F]
D_D.LEFT2,SI/ZERO
R[0]_D ; R[0]=1FC
=0 ALU_D-K[.1],D,ALU,CALL,J/DC8
D_D.RIGHT,SI/ZERO
R[1]_D ; R[1]=7FFFFFFC
R[2]_K[.1F] ; TEST PATTERN COUNTER
R[0C]_K[.1],D_K[.1]
R[0F]_ALU,ALU_D+K[.4]
=0 CALL,J/TBWPTP ; GET TEST PATTERNS
D_K[.FFFF]
D_D.RIGHT,SI/ZERO
ALU_NOT.D,R[4],ALU.RIGHT,SI/ZERO ; R[4]=7FFFC000
=0 ERLOOP
AR2A: D 0 ; TURN OF TB
ID[TBER0]_D
SC R[2]
ALD R[1].AND.MASK,D,ALU ; GENERATE DATA FOR VIBA
R[0A]_D
R[5]_D
ALU_D-K[.4],IBC/FLUSH ; LOAD VIBA
VA_R[0] ; LOAD VA=1FC
FS7MCT,MCT/INVALIDATE ; INVALIDATE 1FC IN BOTH CACHE GROUPS
=0 CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT IN CACHE
D 0 ; WRITE DATA=0 INTO LOCATION 1FC
FS/MCT,MCT/VALIDATE ; OF CACHE GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA_R[5] ; MAKE VIBA A HIT IN BOTH TB GROUPS
LC_R[0]
=0 R[8]_LC,CALL,J/TBWRB

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U 10C9, 0800,003C,0180,0A28,0000,1307 :2732
U 1307, 000D,0020,0180,0A20,0200,1308 :2733
U 1308, 0000,003C,0180,0918,0000,10CA :2734
U 10CA, 0010,0039,0180,0AC0,0000,1012 :2735
U 10CB, 0018,0038,1980,0800,0200,1309 :2736
U 1309, 3000,003C,0180,0800,0000,130A :2737
U 130A, 0000,003C,0180,F800,0000,130B :2738
U 130B, 0000,003C,0180,F800,0000,130C :2739
U 130C, 1000,003C,0180,F800,0000,130D :2740
U 130D, 0000,003C,0180,F800,0000,130E :2741
U 130E, 0000,003C,69F0,2C00,0000,130F :2742
U 130F, 0000,003C,0188,0800,0000,1310 :2743
U 1310, 0000,003C,01A8,0800,0000,1311 :2744
U 1311, 0000,003C,01B0,0800,0000,1312 :2745
U 1312, 0001,203C,0180,09E8,0000,1313 :2746
U 1313, 0000,003C,4DF0,2C00,0000,1314 :2747
U 1314, 0001,203C,0180,09D8,0000,1315 :2748
U 1315, 0810,0038,0180,0910,0000,1316 :2749
U 1316, 0100,003C,0180,0800,0000,1317 :2750
U 1317, 0001,003C,0180,09F0,0000,1318 :2751
U 1318, 0010,0038,01C0,0968,0000,1319 :2752
U 1319, 001D,2000,0180,0800,0010,131A :2753
U 131A, 0000,013C,0180,0800,0000,10CC :2754
U 10CC, 0000,003D,0180,0800,0000,1182 :2755
U 10CD, 0810,0038,0180,0958,0000,131B :2756
U 131B, 0819,0034,0580,0800,0000,131C :2757
U 131C, 0019,0000,0580,0800,0010,131D :2758
U 131D, 0000,013C,0180,0800,0000,10CE :2759
U 10CE, 0000,003D,0180,0800,0000,1182 :2760
U 10CF, 0F00,003C,0180,0800,0000,131E :2761
U 131E, 0000,003C,4980,3C00,0000,131F :2762
U 131F, 0000,003C,0180,0A10,0082,1320 :2763
U 1320, 0800,0024,0180,0A08,0000,1321 :2764
U 1321, 0001,003C,0180,09D0,0000,1322 :2765
U 1322, 0001,003C,0180,0AA8,0000,1323 :2766
U 1323, 2019,0000,1180,0800,0000,1324 :2767
U 1324, 0000,003C,0180,0A00,0200,1325 :2768
U 1325, 0000,003C,0180,9000,0000,10D0 :2769
U 10D0, 0000,003D,0180,0800,0000,121E :2770
U 10D1, 0F00,003C,0180,0800,0000,1326 :2771
U 1326, 0000,003C,0180,9800,0000,1327 :2772
U 1327, 0000,003C,0180,6000,0000,1328 :2773
U 1328, 0000,003C,0180,0A28,0200,1329 :2774
U 1329, 0000,003C,0180,0918,0000,10D2 :2775
U 10D2, 0010,0039,0180,0AC0,0000,1014 :2776
U 10D3, 0800,003C,0180,0A28,0000,132A :2777
U 132A, 0000,003C,0180,0A20,0000,132B :2778
U 132B, 000D,0020,0180,0800,0200,132C :2779
U 132C, 0000,003C,0180,0900,0000,10D4 :2780
U 10D4, 0010,0039,0180,0AC0,0000,100C :2781
U 10D5, 0018,0038,1980,0800,0200,132D :2782
U 132D, 3000,003C,0180,0800,0000,132E :2783
U 132E, 0000,003C,0180,F800,0000,132F :2784
U 132F, 0000,003C,0180,F800,0000,1330 :2785
U 1330, 1000,003C,0180,F800,0000,1331 :2786

=0

=0

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=0

D R[5] ; MAKE VIBA A MISS IN GROUP 0
LAB R[4],ALU_D[XOR]LB,VA_ALU
LC R[3]
R[8] LC,CALL,J/TBWRO
VA K[ZERO] ; CLEAR VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 READ WHICH WILL INCREMENT
FS/MCT,MCT/ALLOW.IB.READ ; THE IPA CAUSING AUTO RELOAD
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET AUTO RELOADED IPA
Q_Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS IN Q PROPERLY
Q_Q.LEFT,SI/ZERO
Q_Q.RIGHT,SI/ZERO
RC[0D] Q
Q_ID[TBER1] ; GET TBER1 TO TEST AUTO RELOAD BIT
RC[0B] Q
D_R[2] ; CHECK THE RELOADED IPA
D_D.LEFT2,SI/ZERO
RC[0E] D
Q_RC[0B]
ALU_Q-D,CLK.UBCC
Z?
ERROR1 ; THE IPA RELOADED FROM GROUP 1 WAS INCORRECT.
D RC[0B] ; CHECK THE AUTO RELOAD BIT
ALU_D[AND]K[.1],D_ALU ; IN TBER1
ALU_D-K[.1],CLK.UBCC
Z?
ERROR1 ; THE AUTO RELOAD BIT IN TBER1 WAS CLEAR
D 0 ; TURN OF THE TB
ID[TBER0]_D
SC R[2] ; RUN TEST WITH COMPLEMENT DATA PATTERN
ALD R[1].ANDNOT.MASK,D_ALU ; COMPUTE VIBA
RC[0A]_D
R[5] D
ALU D-K[.4],IBC/FLUSH ; LOAD VIBA
VA R[0] ; LOAD VA=1FC
FS/MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN BOTH CACHE GROUPS
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 BIT
D 0 ; WRITE DATA=0 INTO LOCATION 1FC
FS/MCT,MCT/VALIDATE ; OF CACHE GROUP 0
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA R[5] ; MAKE VIBA A HIT IN BOTH
LC R[3] ; GROUPS OF THE TB
R[8] LC,CALL,J/TBWRB
D R[5] ; MAKE VIBA A MISS TO TB GROUP 0
LAB R[4]
ALU_D[XOR]LB,VA_ALU
LC R[0]
R[8] LC,CALL,J/TBWR1
VA K[ZERO] ; CLEAR THE VA
IBC/START ; START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ ; LET THE IB MAKE 1 REFERENCE SO
FS/MCT,MCT/ALLOW.IB.READ ; THE IPA GETS INCREMENTED AND RELOADED
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ

U 1331.	0000,003C,0180,F800,0000,1332	:2787	FS/MCT,MCT/ALLOW.IB.READ	
U 1332.	0000,003C,69F0,2C00,0000,1333	:2788	Q_ID[TIME.ADDR]	: GET RELOADED IPA
U 1333.	0000,003C,0188,0800,0000,1334	:2789	Q-Q.LEFT2,SI/ZERO	: JUSTIFY ADDRESS IN Q PROPERLY
U 1334.	0000,003C,01A8,0800,0000,1335	:2790	Q-Q.LEFT,SI/ZERO	
U 1335.	0000,003C,0180,0800,0000,1336	:2791	Q-Q.RIGHT,SI/ZERO	
U 1336.	0001,203C,0180,09E8,0000,1337	:2792	RC[OD] Q	
U 1337.	0000,003C,4DF0,2C00,0000,1338	:2793	Q_ID[TBER1]	: GET TBER1 TO CHECK THE
U 1338.	0001,203C,0180,09D8,0000,1339	:2794	RC[OB] Q	: AUTO RELOAD BIT
U 1339.	0810,0038,0180,0928,0000,133A	:2795	D_RC[5]	: CHECK THE IPA WHICH
U 133A.	0100,003C,0180,0800,0000,133B	:2796	D-D.LEFT2,SI/ZERO	: WAS RELOADED FROM TB GROUP 1
U 133B.	0001,003C,0180,09F0,0000,133C	:2797	RC[OE] D	
U 133C.	0010,0038,01C0,0968,0000,133D	:2798	Q_RC[OD]	
U 133D.	001D,2000,0180,0800,0010,133E	:2799	ALU_Q-D,CLK.UBCC	
U 133E.	0000,013C,0180,0800,0000,10D6	:2800	Z?	
U 10D6.	0000,003D,0180,0800,0000,1182	:2801	ERROR1	: IPA INCORRECT AFTER BEING
		:2802		: RELOADED FROM GROUP 1
U 10D7.	0810,0038,0180,0958,0000,133F	:2803	D_RC[OB]	: CHECK THE AUTO RELOAD
U 133F.	0819,0034,0580,0800,0000,1340	:2804	ALU_D[AND]K[.1],D_ALU	: BIT IN TBER1
U 1340.	0019,0000,0580,0800,0010,1341	:2805	ALU_D-K[.1],CLK.UBCC	
U 1341.	0000,013C,0180,0800,0000,10D8	:2806	Z?	
U 10D8.	0000,003D,0180,0800,0000,1182	:2807	ERROR1	: THE AUTO RELOAD BIT IN TBER1 WAS CLEAR
U 10D9.	0000,003C,0180,0A10,0010,1342	:2808	ALU_R[2],CLK.UBCC	: HAVE ALL DATA PATTERNS BEEN TESTED?
U 1342.	0000,013C,0180,0800,0000,10DA	:2809	Z?	
U 10DA.	0018,0000,0580,0A90,0000,10C5	:2810	R[2]_LA-K[.1],J/AR2A	: IF NOT CONTINUE
U 10DB.	0000,003C,0180,0800,0000,10DC	:2811	NOP	


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U 10DC, 0000,003D,0180,0800,0000,116E
U 10DD, 1F00,003C,0180,0800,0000,10DE
U 10DE, 0000,003D,4980,3C00,0000,1192
U 10DF, 0818,0038,5980,0800,0000,1343
U 1343, 0100,003C,0180,0800,0000,1344
U 1344, 0001,003C,0180,0A80,0000,10E0
U 10E0, 0818,0001,0580,0800,0000,11E5
U 10E1, 0200,003C,0180,0800,0000,1345
U 1345, 0001,003C,0180,0A88,0000,1346
U 1346, 0018,0038,2180,0A90,0000,1347
U 1347, 0818,0038,0580,09E0,0000,1348
U 1348, 0019,0014,1180,09F8,0000,10E2
U 10E2, 0000,003D,0180,0800,0000,11C3
U 10E3, 0000,003C,0180,0800,0000,10E4
U 10E4, 0000,003D,0180,0800,0000,1181
U 10E5, 0F00,003C,0180,0800,0000,1349
U 1349, 0000,003C,4980,3C00,0000,134A
U 134A, 0810,0038,0180,0908,0000,134B
U 134B, 2019,0000,1180,0AAB,0000,134C
U 134C, 0000,003C,0180,0A00,0200,134D
U 134D, 0000,003C,0180,9000,0000,10E6
U 10E6, 0000,003D,0180,0800,0000,121E
U 10E7, 0F00,003C,0180,0800,0000,134E
U 134E, 0000,003C,0180,9800,0000,134F
U 134F, 0000,003C,0180,6000,0000,1350
U 1350, 0010,0038,0180,0908,0200,1351
U 1351, 0010,0038,0180,0AAB,0000,1352
U 1352, 0000,003C,0180,0A10,0082,1353
U 1353, 0800,0034,0180,0A68,0000,1354
U 1354, 080D,0030,0180,0A60,0000,1355
U 1355, 0001,003C,0180,09D0,0000,10E8
U 10E8, 0001,003D,0180,0AB0,0000,1016
U 10E9, 0000,003C,01C0,0A30,0000,10EA

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.PAGE "TEST F5 AUTO RELOAD TEST 4"
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TEST F5 AUTO RELOAD TEST 4
TEST DESCRIPTION
THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
PTE WRITTEN AT VA=4CCCC000 IN TB GROUP 0
LOGIC DESCRIPTION
LOGIC ON TBM IS TESTED HERE
ERROR DESCRIPTION
EXPECTED IPA
GOT IPA
EXPECTED TBER1
GOT TBER1
PTE WRITTEN AT VA=4CCCC000 IN TB GROUP 0
--
*****
=0
AR3: NEWTST
D 0,IBC/STOP ; TURN IB OFF
ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
D_K[.7F]
D-D.LEFT2,SI/ZERO
R[0]_D ; R[0]=1FC
=0 ALU_D-K[.1],D,ALU,CALL,J/DC0
D-D.RIGHT2,SI/ZERO
R[1]_D ; R[1]=3FFFFFFC
R[2]_K[.14]
R[0C]_K[.1],D,K[.1]
ALU_D+R[.4],R[0F]_ALU
=0 CALL,J/TBWPTP ; GET SOME TEST PATTERNS
NOP
=0 ERLOOP
AR3A: D 0 ; TURN TB OFF
ID[TBER0]_D
D_R[1] ; LOAD 4CCCC000-4 INTO VIBA
ALU_D-K[.4],R[5]_ALU,IBC/FLUSH
VA_R[0] ; LOAD 1FC INTO THE VA
FS/MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN CACHE
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 IN CACHE
D 0 ; WRITE DATA=0 INTO LOCATION 0 OF CACHE
FS/MCT,MCT/VALIDATE
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA_R[1] ; MAKE 4CCCC000 A HIT IN BOTH
R[5]_LC ; GROUPS OF THE TB WITH PTE
SC_R[2] ; BEING THE TEST DATA PATTERN
ALU_R[0D].AND.MASK,D,ALU
LAB_R[0C],ALU_D[OR]LB,D,ALU
R[0A]_D
=0 R[6]_D,CALL,J/RELSUB
Q_R[6]

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U 10EA.	0001,203D,0180,0AC0,0000,1014	:2867	=0	RC[8] Q,CALL,J/TBWRB	
U 10EB.	0010,0038,0180,0920,0200,1356	:2868		VA RC[4]	: MAKE ADDRESS=55554000 A HIT IN
U 1356.	0810,0038,0180,0918,0000,10EC	:2869		D RC[3]	: TB GROUP 1 WITH PTE=A4155555
U 10EC.	0001,003D,0180,0AC0,0000,100C	:2870	=0	RC[8] D,CALL,J/TBWR1	
U 10ED.	0018,0038,1980,0800,0200,1357	:2871		VA K[ZERO]	: CLEAR THE VA
U 1357.	3000,003C,0180,0800,0000,1358	:2872		IBC/START	: START IB REFERENCES
U 1358.	0000,003C,0180,F800,0000,1359	:2873		FS/MCT,MCT/ALLOW.IB.READ	: LET IB DO 1 REFERENCE SO THAT THE
U 1359.	0000,003C,0180,F800,0000,135A	:2874		FS/MCT,MCT/ALLOW.IB.READ	: IPA IS INCREMENTED AND
U 135A.	1000,003C,0180,F800,0000,135B	:2875		IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ	: RELOADED
U 135B.	0000,003C,0180,F800,0000,135C	:2876		FS/MCT,MCT/ALLOW.IB.READ	
U 135C.	0000,003C,69F0,2C00,0000,135D	:2877		Q_ID[TIME.ADDR]	: GET RELOADED IPA
U 135D.	0000,003C,0188,0800,0000,135E	:2878		Q-Q.LEFT2,SI/ZERO	: JUSTIFY ADDRESS IN Q PROPERLY
U 135E.	0000,003C,01A8,0800,0000,135F	:2879		Q-Q.LEFT,SI/ZERO	
U 135F.	0000,003C,0180,0800,0000,1360	:2880		Q-Q.RIGHT,SI/ZERO	
U 1360.	0001,203C,0180,09E8,0000,1361	:2881		RC[0D] Q	
U 1361.	0000,003C,4DF0,2C00,0000,1362	:2882		Q_ID[TBER1]	: GET TBER1 SO THAT THE AUTO RELOAD
U 1362.	0001,203C,0180,09D8,0000,1363	:2883		RC[0B] Q	: BIT CAN BE CHECKED
U 1363.	0800,003C,0180,0A38,0000,1364	:2884		D RC[7]	: CHECK THE AUTO RELOADED
U 1364.	0100,003C,0180,0800,0000,1365	:2885		D-D.LEFT2,SI/ZERO	: IPA WHICH WAS RELOCATED
U 1365.	0001,003C,0180,09F0,0000,1366	:2886		RC[0E] D	: FROM GROUP 0 OF THE TB
U 1366.	0010,0038,01C0,0968,0000,1367	:2887		Q RC[0B]	
U 1367.	001D,2000,0180,0800,0010,1368	:2888		ALU-Q-D,CLK.UBCC	
U 1368.	0000,013C,0180,0800,0000,10EE	:2889		Z?	
U 10EE.	0000,003D,0180,0800,0000,1182	:2890	=0	ERROR1	: IPA RELOADED INCORRECTLY
		:2891			: FROM TB GROUP 0
U 10EF.	0810,0038,0180,0958,0000,1369	:2892		D RC[0B]	: CHECK THE AUTO RELOAD BIT IN TBER1
U 1369.	0819,0034,0580,0800,0000,136A	:2893		ALU-D[AND]K[.1],D_ALU	
U 136A.	0019,0000,0580,0800,0010,136B	:2894		ALU-D-K[.1],CLK.UBCC	
U 136B.	0000,013C,0180,0800,0000,10F0	:2895		Z?	
U 10F0.	0000,003D,0180,0800,0000,1182	:2896	=0	ERROR1	: AUTO RELOAD BIT IN TBER1 NOT SET
U 10F1.	0F00,003C,0180,0800,0000,136C	:2897		D 0	: TURN OFF TB
U 136C.	0000,003C,4980,3C00,0000,136D	:2898		ID[TBER0]_D	
U 136D.	0810,0038,0180,0920,0000,136E	:2899		D RC[4]	: LOAD 55554000-4 INTO VIBA
U 136E.	2019,0000,1180,0AA8,0000,136F	:2900		ALU D-K[.4],R[5]_ALU,IBC/FLUSH	
U 136F.	0000,003C,0180,0A00,0200,1370	:2901		VA RC[0]	: LOAD 1FC INTO THE VA
U 1370.	0000,003C,0180,9000,0000,10F2	:2902		FS/MCT,MCT/INVALIDATE	: INVALIDATE 1FC IN CACHE
U 10F2.	0000,003D,0180,0800,0000,121E	:2903	=0	CALL,J/ROS	: SET FORCE REPLACE GROUP 0 BIT IN CACHE
U 10F3.	0F00,003C,0180,0800,0000,1371	:2904		D 0	: WRITE DATA=0 INTO 1FC OF GROUP 0
U 1371.	0000,003C,0180,9800,0000,1372	:2905		FS/MCT,MCT/VALIDATE	
U 1372.	0000,003C,0180,6000,0000,1373	:2906		FS/MCT,MCT/READ.V.NEWPC	: LOAD 1FC INTO IPA
U 1373.	0010,0038,0180,0920,0200,1374	:2907		VA RC[4]	: WRITE VA=55554000 WITH PTE
U 1374.	0010,0038,0180,0AA8,0000,1375	:2908		R[5] LC	: BEING THE TEST PATTERN INTO
U 1375.	0000,003C,0180,0A10,0082,1376	:2909		SC RC[2]	: TB GROUP 0 AND 1
U 1376.	0800,001C,0180,0A60,0000,1377	:2910		ALD RC[0C].ORNOT.MASK,D_ALU	
U 1377.	0001,003C,0180,09D0,0000,10F4	:2911		RC[0A] D	
U 10F4.	0001,003D,0180,0AB0,0000,1016	:2912	=0	RC[6] D,CALL,J/RELSUB	
U 10F5.	0000,003C,01C0,0A30,0000,10F6	:2913		Q RC[8]	
U 10F6.	0001,203D,0180,0AC0,0000,1014	:2914	=0	RC[8] Q,CALL,J/TBWRB	
U 10F7.	0010,0038,0180,0908,0200,1378	:2915		VA RC[1]	: WRITE VA=4CCCC000 WITH
U 1378.	0810,0038,0180,0900,0000,10F8	:2916		D RC[0]	: PTE=A4155555 INTO TB GROUP 1
U 10F8.	0001,003D,0180,0AC0,0000,100C	:2917	=0	RC[8] D,CALL,J/TBWR1	
U 10F9.	0018,0038,1980,0800,0200,1379	:2918		VA K[ZERO]	: CLEAR THE VA
U 1379.	3000,003C,0180,0800,0000,137A	:2919		IBC/START	: START IB REFERENCES
U 137A.	0000,003C,0180,F800,0000,137B	:2920		FS/MCT,MCT/ALLOW.IB.READ	: LET THE IB DO 1 REFERENCE
U 137B.	0000,003C,0180,F800,0000,137C	:2921		FS/MCT,MCT/ALLOW.IB.READ	: SO THAT THE IPA IS INCREMENTED

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IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AND AUTO RELOAD OCCURS
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET RELOADED IPA
Q-Q.LEFT2,SI/ZERO ; JUSTIFY ADDRESS IN Q PROPERLY
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
RC[OD] Q
Q_ID[TBER1] ; GET THE TBER1 TO CHECK
RC[OB] Q ; THE AUTO RELOAD BIT
D-RC[7] ; CHECK THE RELOADED IPA
D-D.LEFT2,SI/ZERO ; WHICH SHOULD HAVE BEEN TRANSLATED
RC[OE] D ; THRU TB GROUP 0
Q-RC[OB]
A[U-Q-D,CLK.UBCC
Z?
ERROR1 ; IPA INCORRECT AFTER AUTO RELOAD
D-RC[OB] ; CHECK THE AUTO RELOAD
A[U-D[AND]K[.1],D-ALU ; BIT IN TBER1
ALU-D-K[.1],CLK.UBCC
Z?
ERROR1 ; AUTO RELOAD BIT NOT SET
ALU-R[2],CLK.UBCC ; HAVE ALL TEST PATTERNS BEEN TRIED?
Z?
R[2]_LA-K[.1],J/AR3A ; IF NOT CONTINUE
NOP

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:2996
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:2999
:3000
:3001
U 110A, 0000,003D,0180,0800,0000,116E
U 110B, 1F00,003C,0180,0800,0000,1110
U 1110, 0000,003D,4980,3C00,0000,1192
U 1111, 0818,0038,5980,0800,0000,138F
U 138F, 0100,003C,0180,0800,0000,1390
U 1390, 0001,003C,0180,0A80,0000,1112
U 1112, 0818,0001,0580,0800,0000,11E5
U 1113, 0200,003C,0180,0800,0000,1391
U 1391, 0001,003C,0180,0A88,0000,1392
U 1392, 0018,0038,2180,0A90,0000,1393
U 1393, 0818,0038,0580,09E0,0000,1394
U 1394, 0019,0014,1180,09F8,0000,1114
U 1114, 0000,003D,0180,0800,0000,11C3
U 1115, 0000,003C,0180,0800,0000,1116
U 1116, 0000,003D,0180,0800,0000,1181
U 1117, 0F00,003C,0180,0800,0000,1395
U 1395, 0000,003C,4980,3C00,0000,1396
U 1396, 0810,0038,0180,0908,0000,1397
U 1397, 2019,0000,1180,0AA8,0000,1398
U 1398, 0000,003C,0180,0A00,0200,1399
U 1399, 0000,003C,0180,9000,0000,1118
U 1118, 0000,003D,0180,0800,0000,121E
U 1119, 0F00,003C,0180,0800,0000,139A
U 139A, 0000,003C,0180,9800,0000,139B
U 139B, 0000,003C,0180,6000,0000,139C
U 139C, 0010,0038,0180,0908,0200,139D
U 139D, 0010,0038,0180,0AA8,0000,139E
U 139E, 0000,003C,0180,0A10,0082,139F
U 139F, 0800,0034,0180,0A68,0000,13A0
U 13A0, 080D,0030,0180,0A60,0000,13A1
U 13A1, 0001,003C,0180,09D0,0000,111A
U 111A, 0001,003D,0180,0A80,0000,1016
U 111B, 0000,003C,01C0,0A30,0000,111C

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.PAGE "TEST F6 AUTO RELOAD TEST 5"
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TEST F6 AUTO RELOAD TEST 5

TEST DESCRIPTION
THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
THE VIBA BEING A HIT IN TB GROUP ONE AND MME=1

LOGIC DESCRIPTION
LOGIC ON TBM IS TESTED HERE

ERROR DESCRIPTION
EXPECTED IPA
GOT IPA
EXPECTED TBER1
GOT TBER1
PTE WRITTEN AT LOCATION VA=4CCCC000 IN TB GROUP 1

--
*****
=0
AR4: NEWTST
D 0,IBC/STOP ; TURN OFF IB
ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
D_K[7F]
D_D.LEFT2,S1/ZERO
R[0]_D ; R[0]=1FC
=0 ALU_D-K[1],D_ALU,CALL,J/DCO
D_D.RIGHT2,S17ZERO
R[1]_D ; R[1]=3FFFFFFC
R[2]_K[14]
R[0C]_K[1],D_K[1]
ALU_D+R[4],R[0F]_ALU
=0 CALL,J/TBWPTP ; GET SOME TEST DATA PATTERNS
NOP
=0 ERLOOP
AR4A: D 0 ; TURN OFF TB
ID[TBER0]_D
D_R[1] ; LOAD 4CCCC000-4 INTO VIBA
ALU_D-K[4],R[5]_ALU,IBC/FLUSH
VA_R[0] ; LOAD 1FC INTO VA
FS/MCT,MCT/INVALIDATE ; INVALIDATE LOCATION 1FC IN CACHE
CALL,J/ROS ; SET FORCE REPLACE GROUP 0 IN CACHE
D 0 ; WRITE DATA=0 INTO GROUP 0
FS/MCT,MCT/VALIDATE ; OF THE CACHE
FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
VA_R[1] ; WRITE VA=4CCCC000 WITH PTE
R[5]_LC ; BEING THE TEST PATTERN INTO
SC_R[2] ; BOTH GROUP OF THE TB
ALU_R[0D].AND.MASK,D_ALU
LAB_R[0C],ALU_D[OR]LB,D_ALU
R[0A]_D
=0 R[6]_D,CALL,J/RELSUB
Q_R[8]

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U 111C, 0001,203D,0180,0AC0,0000,1014 :3002
U 111D, 0010,0038,0180,0920,0200,13A2 :3003
U 13A2, 0810,0038,0180,0918,0000,111E :3004
U 111E, 0001,003D,0180,0AC0,0000,1012 :3005
U 111F, 0018,0038,1980,0800,0200,13A3 :3006
U 13A3, 3000,003C,0180,0800,0000,13A4 :3007
U 13A4, 0000,003C,0180,F800,0000,13A5 :3008
U 13A5, 0000,003C,0180,F800,0000,13A6 :3009
U 13A6, 1000,003C,0180,F800,0000,13A7 :3010
U 13A7, 0000,003C,0180,F800,0000,13A8 :3011
U 13A8, 0000,003C,69F0,2C00,0000,13A9 :3012
U 13A9, 0000,003C,0188,0800,0000,13AA :3013
U 13AA, 0000,003C,01A8,0800,0000,13AB :3014
U 13AB, 0000,003C,01B0,0800,0000,13AC :3015
U 13AC, 0001,203C,0180,09E8,0000,13AD :3016
U 13AD, 0000,003C,4DF0,2C00,0000,13AE :3017
U 13AE, 0001,203C,0180,09D8,0000,13AF :3018
U 13AF, 0800,003C,0180,0A38,0000,13B0 :3019
U 13B0, 0100,003C,0180,0800,0000,13B1 :3020
U 13B1, 0001,003C,0180,09F0,0000,13B2 :3021
U 13B2, 0010,0038,01C0,0968,0000,13B3 :3022
U 13B3, 001D,2000,0180,0800,0010,13B4 :3023
U 13B4, 0000,013C,0180,0800,0000,1120 :3024
U 1120, 0000,003D,0180,0800,0000,1182 :3025

=0 R[8] Q,CALL,J/TBWRB
VA R[4] : WRITE 55554000 WITH PTE=A4199999
D R[3] : INTO TB GROUP 0

=0 R[8] D,CALL,J/TBWRO
VA K[ZERO] : CLEAR THE VA
IBC/START : START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ : LET THE IB DO 1 REFERENCE
FS/MCT,MCT/ALLOW.IB.READ : SO THE IPA GETS INCREMENTED AND
IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ : RELOADED FROM TB GROUP 1
FS/MCT,MCT/ALLOW.IB.READ
Q ID[TIME.ADDR] : GET THE RELOADED IPA
Q-Q.LEFT2,SI/ZERO : JUSTIFY THE ADDRESS IN Q PROPERLY
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
R[0D] Q
Q ID[TBER1] : GET THE TBER1 SO THAT
R[0B] Q : AUTO RELOAD BIT CAN BE CHECKED
D R[7] : CHECK THE IPA WHICH
D-D.LEFT2,SI/ZERO : SHOULD HAVE BEEN RELOADED
R[0E] D : WITH AN ADDRESS RELOCATED
Q R[0B] : FROM TB GROUP 1
ALU Q-D,CLK.UBCC
Z?

=0 ERROR1 : IPA INCORRECT AFTER RELOADED
: FROM GROUP 1
: CHECK THE TBER1
: AUTO RELOAD BIT

U 1121, 0810,0038,0180,0958,0000,13B5 :3027
U 13B5, 0819,0034,0580,0800,0000,13B6 :3028
U 13B6, 0019,0000,0580,0800,0010,13B7 :3029
U 13B7, 0000,013C,0180,0800,0000,1122 :3030
U 1122, 0000,003D,0180,0800,0000,1182 :3031
U 1123, 0F00,003C,0180,0800,0000,13B8 :3032
U 13B8, 0000,003C,4980,3C00,0000,13B9 :3033
U 13B9, 0810,0038,0180,0920,0000,13BA :3034
U 13BA, 2019,0000,1180,0AA8,0000,13BB :3035
U 13BB, 0000,003C,0180,0A00,0200,13BC :3036
U 13BC, 0000,003C,0180,9000,0000,1124 :3037
U 1124, 0000,003D,0180,0800,0000,121E :3038
U 1125, 0F00,003C,0180,0800,0000,13BD :3039
U 13BD, 0000,003C,0180,9800,0000,13BE :3040
U 13BE, 0000,003C,0180,6000,0000,13BF :3041
U 13BF, 0010,0038,0180,0920,0200,13C0 :3042
U 13C0, 0010,0038,0180,0AA8,0000,13C1 :3043
U 13C1, 0000,003C,0180,0A10,0082,13C2 :3044
U 13C2, 0800,001C,0180,0A60,0000,13C3 :3045
U 13C3, 0001,003C,0180,09D0,0000,1126 :3046
U 1126, 0001,003D,0180,0AB0,0000,1016 :3047
U 1127, 0000,003C,01C0,0A30,0000,1128 :3048
U 1128, 0001,203D,0180,0AC0,0000,1014 :3049
U 1129, 0010,0038,0180,0908,0200,13C4 :3050
U 13C4, 0810,0038,0180,0900,0000,112A :3051
U 112A, 0001,003D,0180,0AC0,0000,1012 :3052
U 112B, 0018,0038,1980,0800,0200,13C5 :3053
U 13C5, 3000,003C,0180,0800,0000,13C6 :3054
U 13C6, 0000,003C,0180,F800,0000,13C7 :3055
U 13C7, 0000,003C,0180,F800,0000,13C8 :3056

=0 R[6] D,CALL,J/RELSUB
Q R[8]
=0 R[8] Q,CALL,J/TBWRB
VA R[1] : MAKE VA=4CCCC000 AND PTE=A4155555
D R[0] : A HIT IN TB GROUP 0

=0 R[8] D,CALL,J/TBWRO
VA K[ZERO] : CLEAR THE VA
IBC/START : START IB REFERENCES
FS/MCT,MCT/ALLOW.IB.READ : LET THE IB DO 1 REFERENCE SO
FS/MCT,MCT/ALLOW.IB.READ : THE IPA GETS INCREMENTED AND

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U 13C8, 1000,003C,0180,F800,0000,13C9 :3057
U 13C9, 0000,003C,0180,F800,0000,13CA :3058
U 13CA, 0000,003C,69F0,2C00,0000,13CB :3059
U 13CB, 0000,003C,0188,0800,0000,13CC :3060
U 13CC, 0000,003C,01A8,0800,0000,13CD :3061
U 13CD, 0000,003C,01B0,0800,0000,13CE :3062
U 13CE, 0001,203C,0180,09E8,0000,13CF :3063
U 13CF, 0000,003C,4DF0,2C00,0000,13D0 :3064
U 13D0, 0001,203C,0180,09D8,0000,13D1 :3065
U 13D1, 0800,003C,0180,0A38,0000,13D2 :3066
U 13D2, 0100,003C,0180,0800,0000,13D3 :3067
U 13D3, 0001,003C,0180,09F0,0000,13D4 :3068
U 13D4, 0010,0038,01C0,0968,0000,13D5 :3069
U 13D5, 001D,2000,0180,0800,0010,13D6 :3070
U 13D6, 0000,013C,0180,0800,0000,112C :3071
U 112C, 0000,003D,0180,0800,0000,1182 :3072
U 112D, 0810,0038,0180,0958,0000,13D7 :3073
U 13D7, 0819,0034,0580,0800,0000,13D8 :3074
U 13D8, 0019,0000,0580,0800,0010,13D9 :3075
U 13D9, 0000,013C,0180,0800,0000,112E :3076
U 112E, 0000,003D,0180,0800,0000,1182 :3077
U 112F, 0000,003C,0180,0A10,0010,13DA :3078
U 13DA, 0000,013C,0180,0800,0000,1130 :3079
U 1130, 0018,0000,0580,0A90,0000,1117 :3080
U 1131, 0000,003C,0180,0800,0000,1132 :3081
U 1132, 0000,003D,0180,0800,0000,116E :3083
U 1133, 0000,003C,0180,0800,0000,1134 :3084
U 1134, 0000,003D,0180,0800,0000,116E :3086
U 1135, 0000,003C,0180,0800,0000,1136 :3087
U 1136, 0000,003D,0180,0800,0000,116E :3089
U 1137, 0000,003C,0180,0800,0000,1138 :3090
U 1138, 0000,003D,0180,0800,0000,116E :3092
U 1139, 0000,003C,0180,0800,0000,113A :3093
U 113A, 0000,003D,0180,0800,0000,116E :3095
U 113B, 0000,003C,0180,0800,0000,113C :3096
U 113C, 0000,003D,0180,0800,0000,116E :3098
U 113D, 0000,003C,0180,0800,0000,113E :3099
U 113E, 0000,003D,0180,0800,0000,116E :3101
U 113F, 0000,003C,0180,0800,0000,1140 :3102
U 1140, 0000,003D,0180,0800,0000,116E :3104
U 1141, 0000,003C,0180,0800,0000,1142 :3105
U 1142, 0000,003D,0180,0800,0000,116E :3107
U 1143, 0000,003C,0180,0800,0000,1144 :3108
U 1144, 0000,003D,0180,0800,0000,116E :3110
U 1145, 0000,003C,0180,0800,0000,1146 :3111

IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; RELOADED FROM GROUP 1
FS/MCT,MCT/ALLOW.IB.READ
Q_ID[TIME.ADDR] ; GET THE RELOADED IPA
Q-Q.LEFT2,SI/ZERO ; JUSTIFY THE ADDRESS IN Q PROPERLY
Q-Q.LEFT,SI/ZERO
Q-Q.RIGHT,SI/ZERO
R[OD] Q
Q_ID[TBER1] ; GET TBER1 SO THAT
R[OB] Q ; THE AUTO RELOAD BIT CAN BE CHECKED
D R[7] ; CHECK THE IPA WHICH
D-D.LEFT2,SI/ZERO ; SHOULD HAVE BEEN RELOADED
R[OE] D ; WITH AN ADDRESS RELOCATED
Q R[OB] ; THRU TB GROUP 1
A[U-Q-D,CLK.UBCC
Z?
=0 ERROR1 ; IPA INCORRECT AFTER RELOAD
D R[OB] ; CHECK THE AUTO
A[U-D[AND]K[.1],D ALU ; RELOAD BIT IN TBER1
ALU-D-K[.1],CLK.UBCC
Z?
=0 ERROR1 ; TBER1 AUTO RELOAD BIT NOT SET
ALU_R[2],CLK.UBCC ; TESTED ALL PATTERNS?
Z?
=0 R[2]_LA-K[.1],J/AR4A ; IF NOT CONTINUE
NOP
=0
DUMOF7: NEWTST
NOP
=0
DUMOF8: NEWTST
NOP
=0
DUMOF9: NEWTST
NOP
=0
DUMOFA: NEWTST
NOP
=0
DUMOFB: NEWTST
NOP
=0
DUMOFC: NEWTST
NOP
=0
DUMOFD: NEWTST
NOP
=0
DUMOFE: NEWTST
NOP
=0
DUMOFF: NEWTST
NOP
=0
DUM100: NEWTST
NOP

U 1146, 0000,003D,0180,0800,0000,116E	:3112	=0	
U 1147, 0000,003C,0180,0800,0000,1148	:3113	DUM101: NEWTST	
	:3114	NOP	
U 1148, 0000,003D,0180,0800,0000,116E	:3115	=0	
U 1149, 0000,003C,0180,0800,0000,114A	:3116	DUM102: NEWTST	
	:3117	NOP	
U 114A, 0000,003D,0180,0800,0000,116E	:3118	=0	
U 114B, 0000,003C,0180,0800,0000,114C	:3119	DUM103: NEWTST	
	:3120	NOP	
U 114C, 0000,003D,0180,0800,0000,116E	:3121	=0	
U 114D, 0000,003C,0180,0800,0000,114E	:3122	DUM104: NEWTST	
	:3123	NOP	
U 114E, 0000,003D,0180,0800,0000,116E	:3124	=0	
U 114F, 0000,003C,0180,0800,0000,1150	:3125	DUM105: NEWTST	
	:3126	NOP	
U 1150, 0000,003D,0180,0800,0000,116E	:3127	=0	
U 1151, 0000,003C,0180,0800,0000,1152	:3128	DUM106: NEWTST	
	:3129	NOP	
U 1152, 0000,003D,0180,0800,0000,116E	:3130	=0	
U 1153, 0000,003C,0180,0800,0000,1156	:3131	DUM107: NEWTST	
	:3132	NOP	
U 1156, 0000,003D,0180,0800,0000,116E	:3133	=0	
U 1157, 0000,003C,0180,0800,0000,1158	:3134	DUM108: NEWTST	
	:3135	NOP	
U 1158, 0000,003D,0180,0800,0000,116E	:3136	=0	
U 1159, 0000,003C,0180,0800,0000,115A	:3137	DUM109: NEWTST	
	:3138	NOP	
U 115A, 0000,003D,0180,0800,0000,116E	:3139	=0	
U 115B, 0000,003C,0180,0800,0000,115C	:3140	DUM10A: NEWTST	
	:3141	NOP	
U 115C, 0000,003D,0180,0800,0000,116E	:3142	=0	
U 115D, 0000,003C,0180,0800,0000,115E	:3143	DUM10B: NEWTST	
	:3144	NOP	
U 115E, 0000,003D,0180,0800,0000,116E	:3145	=0	
U 115F, 0000,003C,0180,0800,0000,1160	:3146	DUM10C: NEWTST	
	:3147	NOP	
U 1160, 0000,003D,0180,0800,0000,116E	:3148	=0	
U 1161, 0000,003C,0180,0800,0000,1162	:3149	DUM10D: NEWTST	
	:3150	NOP	
U 1162, 0000,003D,0180,0800,0000,116E	:3151	=0	
U 1163, 0000,003C,0180,0800,0000,1164	:3152	DUM10E: NEWTST	
	:3153	NOP	
U 1164, 0000,003D,0180,0800,0000,116E	:3154	=0	
U 1165, 0000,003C,0180,0800,0000,13DB	:3155	DUM10F: NEWTST	
U 13DB, 0000,003D,0180,0800,0000,116E	:3156	NOP	
	:3157	DUMMY: NEWTST	

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 : Location / Line Number Index

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1871=	1838	1845=	1861=	1862=	1863=	1952=	1953=
U 1008	1971=	1972=	1973=	1974=	1983=	1984=	1985=	1986=
U 1010	1987=	1988=	1993=	1994=	1997=	1998=	2007=	2008=
U 1018	2009=	2010=	2026=	2027=	2028=	2029=	2039=	2040=
U 1020	2053=	2054=	2058=	2059=	2074=	2075=	2077=	2078=
U 1028	2082=	2083=	2123=	2124=	2128=	2129=	2131=	2132=
U 1030	2133=	2134=	2138=	2139=	2141=	2142=	2143=	2144=
U 1038	2148=	2149=	2151=	2152=	2153=	2154=	2158=	2159=
U 1040	2161=	2162=	2168=	2169=	2170=	2171=	2196=	2197=
U 1048	2199=	2200=	2202=	2203=	2206=	2207=	1902=	1839
U 1050	2209=	2210=	2212=	2213=	2216=	2217=	2220=	2221=
U 1058	2226=	2227=	1905=	1840	2229=	2230=	1908=	1841
U 1060	2239=	2240=	2242=	2243=	2245=	2246=	2248=	2249=
U 1068	2263=	2264=	2271=	2272=	2285=	2286=	2338=	2339=
U 1070	2340=	2341=	2347=	2348=	2352=	2353=	2372=	2373=
U 1078	2375=	2376=	2396=	2397=	2398=	2399=	2404=	2405=
U 1080	2411=	2412=	2428=	2429=	2431=	2432=	2453=	2454=
U 1088	2455=	2456=	2459=	2460=	2465=	2466=	2472=	2473=
U 1090	2495=	2496=	2500=	2501=	2507=	2508=	2530=	2531=
U 1098	2535=	2536=	2538=	2539=	2565=	2566=	2567=	2568=
U 10A0	2571=	2572=	2576=	2577=	2580=	2581=	2590=	2591=
U 10A8	2596=	2597=	2600=	2601=	2620=	2622=	2626=	2627=
U 10B0	2636=	2637=	2642=	2643=	2646=	2647=	2666=	2668=
U 10B8	2672=	2673=	2675=	2676=	2699=	2700=	2701=	2702=
U 10C0	2705=	2706=	2711=	2712=	2715=	2716=	2725=	2726=
U 10C8	2731=	2732=	2735=	2736=	2755=	2756=	2760=	2761=
U 10D0	2770=	2771=	2776=	2777=	2781=	2782=	2801=	2803=
U 10D8	2807=	2808=	2810=	2811=	2834=	2835=	2836=	2837=
U 10E0	2840=	2841=	2846=	2847=	2848=	2849=	2855=	2856=
U 10E8	2865=	2866=	2867=	2868=	2870=	2871=	2890=	2892=
U 10F0	2896=	2897=	2903=	2904=	2912=	2913=	2914=	2915=
U 10F8	2917=	2918=	2937=	2938=	2942=	2943=	2945=	2946=
U 1100	1825=	1826=	1827=	1828=	1829=	1830=	1831=	1832=
U 1108	1833=	1842	2969=	2970=	1834=	1835=	1836=	1837=
U 1110	2971=	2972=	2975=	2976=	2981=	2982=	2983=	2984=
U 1118	2990=	2991=	3000=	3001=	3002=	3003=	3005=	3006=
U 1120	3025=	3027=	3031=	3032=	3038=	3039=	3047=	3048=
U 1128	3049=	3050=	3052=	3053=	3072=	3073=	3077=	3078=
U 1130	3080=	3081=	3083=	3084=	3086=	3087=	3089=	3090=
U 1138	3092=	3093=	3095=	3096=	3098=	3099=	3101=	3102=
U 1140	3104=	3105=	3107=	3108=	3110=	3111=	3113=	3114=
U 1148	3116=	3117=	3119=	3120=	3122=	3123=	3125=	3126=
U 1150	3128=	3129=	3131=	3132=	1843	1928=	3134=	3135=
U 1158	3137=	3138=	3140=	3141=	3143=	3144=	3146=	3147=
U 1160	3149=	3150=	3152=	3153=	3155=	3156=	1844	1864
U 1168	1865	1866	1867	1868	1869	1870	1880	1881
U 1170	1882	1883	1884	1885	1886	1887	1888	1889
U 1178	1890	1891	1892	1893	1894	1895	1896	1897
U 1180	1898	1899	1900	1901	1903	1904	1936	1937
U 1188	1943	1944	1945	1951	1954	1955	1958	1959
U 1190	1960	1961	1964	1965	1966	1989	1990	2000
U 1198	2011	2012	2013	2019	2020	2021	2022	2023

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2024	2025	2030	2031	2032	2033	2034	2035
U 11A8	2036	2037	2038	2045	2046	2047	2048	2049
U 11B0	2050	2051	2052	2055	2056	2057	2066	2067
U 11B8	2068	2069	2070	2071	2072	2073	2076	2079
U 11C0	2080	2081	2085	2111	2112	2113	2114	2115
U 11C8	2116	2117	2118	2119	2120	2121	2122	2125
U 11D0	2126	2127	2130	2135	2136	2137	2140	2145
U 11D8	2146	2147	2150	2155	2156	2157	2160	2166
U 11E0	2167	2173	2174	2175	2176	2177	2178	2179
U 11E8	2180	2181	2182	2183	2184	2185	2186	2187
U 11F0	2188	2189	2190	2191	2192	2193	2194	2198
U 11F8	2204	2208	2214	2218	2222	2224	2228	2250
U 1200	2251	2252	2253	2254	2255	2256	2257	2258
U 1208	2259	2260	2261	2262	2265	2266	2267	2268
U 1210	2269	2270	2273	2274	2278	2279	2280	2281
U 1218	2282	2283	2284	2291	2292	2293	2295	2296
U 1220	2297	2298	2300	2301	2303	2304	2306	2307
U 1228	2309	2310	2311	2313	2314	2315	2317	2342
U 1230	2343	2344	2345	2346	2349	2350	2351	2354
U 1238	2355	2356	2357	2358	2359	2360	2361	2362
U 1240	2363	2364	2365	2366	2367	2368	2369	2370
U 1248	2371	2374	2400	2401	2402	2403	2406	2407
U 1250	2408	2409	2410	2413	2414	2415	2416	2417
U 1258	2418	2419	2420	2421	2422	2423	2424	2425
U 1260	2426	2427	2430	2457	2458	2461	2462	2463
U 1268	2464	2467	2468	2469	2470	2471	2474	2475
U 1270	2476	2477	2478	2479	2480	2481	2482	2483
U 1278	2484	2485	2486	2487	2488	2489	2490	2491
U 1280	2492	2493	2494	2497	2498	2499	2502	2503
U 1288	2504	2505	2506	2509	2510	2511	2512	2513
U 1290	2514	2515	2516	2517	2518	2519	2520	2521
U 1298	2522	2523	2524	2525	2526	2527	2528	2529
U 12A0	2532	2533	2534	2537	2569	2570	2573	2574
U 12A8	2575	2578	1929:	2579	2582	2583	2584	2585
U 12B0	2586	2587	2588	2589	2592	2593	2594	2595
U 12B8	2598	2599	2602	2603	2604	2605	2606	2607
U 12C0	2608	2609	2610	2611	2612	2613	2614	2615
U 12C8	2616	2617	2618	2619	2623	2624	2625	2628
U 12D0	2629	2630	2631	2632	2633	2634	2635	2638
U 12D8	2639	2640	2641	2644	2645	2648	2649	2650
U 12E0	2651	2652	2653	2654	2655	2656	2657	2658
U 12E8	2659	2660	2661	2662	2663	2664	2665	2669
U 12F0	2670	2671	2674	2703	2704	2707	2708	2709
U 12F8	2710	2713	2714	2717	2718	2719	2720	2721
U 1300	2722	2723	2724	2727	2728	2729	2730	2733
U 1308	2734	2737	2738	2739	2740	2741	2742	2743
U 1310	2744	2745	2746	2747	2748	2749	2750	2751
U 1318	2752	2753	2754	2757	2758	2759	2762	2763
U 1320	2764	2765	2766	2767	2768	2769	2772	2773
U 1328	2774	2775	2778	2779	2780	2783	2784	2785
U 1330	2786	2787	2788	2789	2790	2791	2792	2793
U 1338	2794	2795	2796	2797	2798	2799	2800	2804
U 1340	2805	2806	2809	2838	2839	2842	2843	2844

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2845	2850	2851	2852	2853	2854	2857	2858
U 1350	2859	2860	2861	2862	2863	2864	2869	2872
U 1358	2873	2874	2875	2876	2877	2878	2879	2880
U 1360	2881	2882	2883	2884	2885	2886	2887	2888
U 1368	2889	2893	2894	2895	2898	2899	2900	2901
U 1370	2902	2905	2906	2907	2908	2909	2910	2911
U 1378	2916	2919	2920	2921	2922	2923	2924	2925
U 1380	2926	2927	2928	2929	2930	2931	2932	2933
U 1388	2934	2935	2936	2939	2940	2941	2944	2973
U 1390	2974	2977	2978	2979	2980	2985	2986	2987
U 1398	2988	2989	2992	2993	2994	2995	2996	2997
U 13A0	2998	2999	3004	3007	3008	3009	3010	3011
U 13A8	3012	3013	3014	3015	3016	3017	3018	3019
U 13B0	3020	3021	3022	3023	3024	3028	3029	3030
U 13B8	3033	3034	3035	3036	3037	3040	3041	3042
U 13C0	3043	3044	3045	3046	3051	3054	3055	3056
U 13C8	3057	3058	3059	3060	3061	3062	3063	3064
U 13D0	3065	3066	3067	3068	3069	3070	3071	3074
U 13D8	3075	3076	3079	3157				
U 13E0 - 13EF	Unused							
U 13F0	1912:	1913:	1914:	1915:	1916:	1917:	1918:	1919:
U 13F8	1920:	1921:	1922:	1923:	1924:	1925:	1926:	1927:

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Words not
in bounds

ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH32	1004

Used 1004
Remaining

Total microwords used in memory U: 1004
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

CCCCC

ZZ-ESKAH-V132 Line Number Index J 13
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; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH32.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2306	TEST 110 INSTRUCTION BUFFER STALL
: 2356	TEST 111 A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF
: 2454	TEST 112 BYTE 0 SHIFT CONTROL
: 2659	TEST 113 BYTE 1 SHIFT CONTROL
: 2913	TEST 114 BYTE 2-6 SHIFT CONTROL
: 3376	TEST 115 BYTE ROTATOR DATA INTEGRITY

ZZ-ESKAH-V132 Subroutines
ESKAH33.MCR

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:1
:1804
:1805

.NOLIST
.LIST

ZE
CCCCCCCC
CCCCCCCC

```

:1806 .REGION/1000,13FF
:1807
:1808
:1809 :+
:1810 : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
:1811 : WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
:1812 : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
:1813 : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
:1814 : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
:1815 :
:1816 : FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
:1817 : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
:1818 : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
:1819 : R[OF] AND DO A RETURN0.
:1820 :
:1821 : IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
:1822 : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
:1823 : TO THE CONSOLE.
:1824 :
:1825 : THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
:1826 : ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
:1827 : EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
:1828 : RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
:1829 : STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
:1830 :-
:1831
U 1100, 0000,003C,19C0,0A78,0084,7001 :1831 1100: SC_K[ZERO],Q_R[OF],J/TRPH0 ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001 :1832 1101: SC_K[.1],Q_R[OF],J/TRPH0 ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001 :1833 1102: SC_K[.2],Q_R[OF],J/TRPH0 ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001 :1834 1103: SC_K[.3],Q_R[OF],J/TRPH0 ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001 :1835 1104: SC_K[.4],Q_R[OF],J/TRPH0 ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001 :1836 1105: SC_K[.6],Q_R[OF],J/TRPH0 ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001 :1837 1106: SC_K[.9],Q_R[OF],J/TRPH0 ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001 :1838 1107: SC_K[.7],Q_R[OF],J/TRPH0 ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001 :1839 1108: SC_K[.8],Q_R[OF],J/TRPH0 ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001 :1840 110C: SC_K[.C],Q_R[OF],J/TRPH0 ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001 :1841 110D: SC_K[.D],Q_R[OF],J/TRPH0 ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001 :1842 110E: SC_K[.10],Q_R[OF],J/TRPH0 ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,71DD :1843 110F: SC_K[.F],Q_R[OF],J/TRPH2 ; CS PARITY
:1844
U 1001, 0001,2024,0180,0800,0010,104F :1845 TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002 :1846 Z? ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000 :1847 =0 ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
:1848
:1849
:1850 :+
:1851 : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
:1852 : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
:1853 : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
:1854 :
:1855 : DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
:1856 : TRAP CODE--INDICATES WHICH TRAP OCCURRED
:1857 : FAULT STATUS REGISTER
:1858 : SBI ERROR REGISTER
:1859 : TIMEOUT ADDRESS REGISTER
:1860 : MAINTENANCE REGISTER

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U 1003.	0018.	0038.	1D80.	09E8.	0000.	1004.	1861
U 1004.	0000.	003D.	D980.	0800.	0084.	730F.	1862
U 1005.	0000.	003C.	49F0.	2C00.	0000.	105B.	1863
U 105B.	0001.	203C.	4DF0.	2DB0.	0000.	105F.	1864
U 105F.	0001.	203C.	65F0.	2DB8.	0000.	1109.	1865
U 1109.	0001.	203C.	6DF0.	2DD8.	0000.	1154.	1866
U 1154.	0001.	203C.	75F0.	2DE0.	0000.	11DA.	1867
U 11DA.	0001.	203C.	79F0.	2DC8.	0000.	11DB.	1868
U 11DB.	0001.	203C.	69F0.	2DC0.	0000.	11DC.	1869
U 11DC.	0001.	203C.	81F0.	2DD0.	0000.	1000.	1870
U 1000.	0001.	203D.	0180.	09F0.	0000.	11F4.	1871
							1872
							1873
							1874
							1875
							1876
							1877
							1878
							1879
							1880
							1881
U 11DD.	0001.	2024.	0180.	0800.	0010.	11DE.	1882
U 11DE.	0000.	013C.	0180.	0800.	0000.	1006.	1883
U 1006.	0001.	2036.	0180.	0AF8.	0000.	0001.	1884
U 1007.	0000.	003C.	0180.	0800.	0000.	1003.	1885
							1886
							1887
							1888
							1889
							1890
							1891
							1892
							1893
							1894
							1895
							1896
U 11DF.	0000.	003C.	65F8.	0800.	0084.	71E0.	1897
U 11E0.	0818.	0038.	8D80.	0800.	0000.	11E1.	1898
U 11E1.	0D00.	003C.	0180.	0800.	0000.	11E2.	1899
U 11E2.	0000.	003C.	3D80.	3C00.	0000.	11E3.	1900
U 11E3.	0818.	0038.	0580.	0800.	0000.	11E4.	1901
U 11E4.	0D00.	003C.	0180.	0800.	0000.	11E5.	1902
U 11E5.	0F00.	003C.	3180.	3C00.	0000.	11E6.	1903
U 11E6.	0000.	003C.	5D80.	3C00.	0000.	11E7.	1904
U 11E7.	0000.	003C.	3980.	3C00.	0000.	11E8.	1905
U 11E8.	0000.	003C.	2980.	3C00.	0000.	11E9.	1906
U 11E9.	0000.	003C.	4980.	3C00.	0000.	11EA.	1907
U 11EA.	0000.	003C.	7180.	3C00.	0000.	11EB.	1908
U 11EB.	0818.	0038.	C180.	0800.	0000.	11EC.	1909
U 11EC.	0000.	003C.	6580.	3C00.	0000.	11ED.	1910
U 11ED.	0F00.	003C.	6D80.	3C00.	0000.	11EE.	1911
U 11EE.	0000.	003C.	6D80.	3C00.	0000.	11EF.	1912
U 11EF.	0000.	003C.	6580.	3C00.	0000.	11F0.	1913
U 11F0.	0003.	003C.	0180.	09F0.	0000.	11F1.	1914
U 11F1.	0003.	003C.	0180.	0AF8.	0000.	11F2.	1915

```

CACHE PARITY REGISTER
TB ERROR REGISTER 1
TB ERROR REGISTER 0

TRPH1: RC[OD] SC
=0 SETRCF[.9]
Q_ID[TBERO]
RC[6]-Q,Q-ID[TBER1]
RC[7]-Q,Q-ID[SBI.ERR]
RC[OB]-Q,Q-ID[FAULT]
RC[OC]-Q,Q-ID[MAINT]
RC[9]-Q,Q-ID[PARITY]
RC[8]-Q,Q-ID[TIME.ADDR]
RC[OA]-Q,Q-ID[USTACK]
1000: RC[OE]-Q,ERROR1

;+
; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
;-

TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS THE TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU Q[AND]MASK,R[OF]_ALU,RETURN1 ; RETURN
J/TRPH1 ; REPORT UNEXPECTED TRAP

;+
; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
NEWST
ERLOOP
ERROR1
ERROR2

SCOPE: SC_KC[.10],Q_0 ; SETUP TO WRITE IPL OF 1F
D_RC[.1F] ; ...
D-DAL.SC
ID[PSL] D ; WRITE THE PSL
D_K[.1] ; SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES] D,D_0 ; CLEAR THE CES REGISTER
ID[ACC.CS] D ; SHUT OFF THE FLOATING POINT
ID[SIR] D ; CLEAR THE SIR REGISTER
ID[CLK.CS] D ; STOP INTERVAL TIMER
ID[TBERO] D ; SHUT OFF THE TB
ID[COMP] D ; CLEAR SILO COMPARATOR
D_K[.FFFF]
ID[SBI.ERR] D
ID[FAULT] D,D_0
ID[FAULT] D
ID[SBI.ERR] D
RC[OE] 0
R[OF] 0

```


22-ESKAH-V132 Subroutines
ESKAH33.MCR

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SEQ 0784
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U 11F2, 0003,003C,0180,09E8,0000,105E :1916
U 11F3, 0818,0038,0980,0800,0000,105E :1917
U 11F4, 0810,0038,0180,0978,0000,11F5 :1918
U 11F5, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 11F6, 0810,0038,0180,0978,0000,11F7 :1922
U 11F7, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
:1927
U 105E, 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,11F8 :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 11F8, 0018,0038,1980,0800,0000,1308 :1966
U 11F9, 0018,0038,1980,0800,0000,1309 :1967
U 11FA, 0018,0038,1980,0800,0000,130A :1968
U 11FB, 0018,0038,1980,0800,0000,130B :1969
U 11FC, 0018,0038,0980,0800,0000,1308 :1970

```

```

RC[0D] 0,J/CALLCON
ERLOOP: D_K[.2],J/CALLCON
ERROR1: D_RC[0F]
: D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON

```

```

: CALL THE CONSOLE
: ERRLOOP CALL

```

```

ERROR2: D_RC[0F]
: D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON

```

```

105E:
CALLCON:
ID[TXDB]_D,J/CALLCON

```

```

: CALL THE CONSOLE

```

```

;+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
;-

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

```

```

;+
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.

```

```

: FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
: THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

```

```

:
: =0 D_0,CALL,J/DC5
: NOP
: =0 CALL,J/DC5
;-

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```

ZZ-ESKAH-V132 Subroutines
ESKAH33.MCR

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```

U 11FD, 0018,0038,0980,0800,0000,1309 :1971 DC5: ALU_K[.2],J/S01
U 11FE, 0018,0038,0980,0800,0000,130A :1972 DC6: ALU_K[.2],J/S10
U 11FF, 0018,0038,0980,0800,0000,130B :1973 DC7: ALU_K[.2],J/S11
U 1300, 0018,0038,0580,0800,0000,1308 :1974 DC8: ALU_K[.1],J/S00
U 1301, 0018,0038,0580,0800,0000,1309 :1975 DC9: ALU_K[.1],J/S01
U 1302, 0018,0038,0580,0800,0000,130A :1976 DCA: ALU_K[.1],J/S10
U 1303, 0018,0038,0580,0800,0000,130B :1977 DCB: ALU_K[.1],J/S11
U 1304, 0018,0038,C180,0800,0000,1308 :1978 DCC: ALU_K[.FFFF],J/S00
U 1305, 0018,0038,C180,0800,0000,1309 :1979 DCD: ALU_K[.FFFF],J/S01
U 1306, 0018,0038,C180,0800,0000,130A :1980 DCE: ALU_K[.FFFF],J/S10
U 1307, 0018,0038,C180,0800,0000,130B :1981 DCF: ALU_K[.FFFF],J/S11
:1982
U 1308, 0118,0038,1B80,0800,0000,130C :1983 S00: ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 1309, 0118,0038,0B80,0800,0000,130C :1984 S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 130A, 0118,0038,0780,0800,0000,130C :1985 S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 130B, 0118,0038,C380,0800,0000,130C :1986 S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
:1987
U 130C, 0100,003E,0380,0800,0000,0001 :1988 SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT
:1989
:1990
:1991 ;+
:1992 ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1993 ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1994 ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1995 ; TYPING IT.
:1996 ; -
:1997
U 130D, 0810,0038,4D80,0978,0000,130E :1998 SUBTST: D_RC[0F],KMX/.FF00
U 130E, 0019,4016,4D80,09F8,0000,0001 :1999 RC[0F],D+K[.FF00],WORD,RETURN1
:2000
:2001 ;+
:2002 ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:2003 ; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:2004 ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:2005 ; -
:2006
U 130F, 0010,0038,01C0,0978,0000,1310 :2007 SETRCF: Q_RC[0F]
U 1310, 0019,2034,4DC0,0800,0000,1311 :2008 Q-Q.AND.K[.FF00]
U 1311, 0019,2032,1D80,09F8,0000,0001 :2009 RC[0F],Q.OR.SC,RETURN1
:2010

```

:2011
 :2012
 :2013
 :2014
 :2015
 :2016
 :2017
 :2018
 :2019
 :2020
 :2021
 :2022
 :2023
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 :2061
 :2062
 :2063
 :2064
 :2065

;+ THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
 ; THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
 ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
 ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
 ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
 ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
 ;-

SYNCOO:

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL

1200:

DISPATTBL:

1200: Q-Q-K[.1]
 1201: Q-Q-K[.1]
 1202: Q-Q-K[.1]
 1203: Q-Q-K[.1]
 1204: Q-Q-K[.1]
 1205: Q-Q-K[.1]
 1206: Q-Q-K[.1]
 1207: Q-Q-K[.1]
 1208: Q-Q-K[.1]
 1209: Q-Q-K[.1]
 120A: Q-Q-K[.1]
 120B: Q-Q-K[.1]
 120C: Q-Q-K[.1]
 120D: Q-Q-K[.1]
 120E: Q-Q-K[.1]
 120F: Q-Q-K[.1]
 1210: Q-Q-K[.1]
 1211: Q-Q-K[.1]
 1212: Q-Q-K[.1]
 1213: Q-Q-K[.1]
 1214: Q-Q-K[.1]
 1215: Q-Q-K[.1]
 1216: Q-Q-K[.1]
 1217: Q-Q-K[.1]
 1218: Q-Q-K[.1]
 1219: Q-Q-K[.1]
 121A: Q-Q-K[.1]
 121B: Q-Q-K[.1]
 121C: Q-Q-K[.1]
 121D: Q-Q-K[.1]
 121E: Q-Q-K[.1]
 121F: Q-Q-K[.1]
 1220: Q-Q-K[.1]
 1221: Q-Q-K[.1]
 1222: Q-Q-K[.1]
 1223: Q-Q-K[.1]
 1224: Q-Q-K[.1]
 1225: Q-Q-K[.1]
 1226: Q-Q-K[.1]

U 1312, 0038,003B,41C0,0800,0000,1200

U 1200, 0019,2000,05C0,0800,0000,1201
 U 1201, 0019,2000,05C0,0800,0000,1202
 U 1202, 0019,2000,05C0,0800,0000,1203
 U 1203, 0019,2000,05C0,0800,0000,1204
 U 1204, 0019,2000,05C0,0800,0000,1205
 U 1205, 0019,2000,05C0,0800,0000,1206
 U 1206, 0019,2000,05C0,0800,0000,1207
 U 1207, 0019,2000,05C0,0800,0000,1208
 U 1208, 0019,2000,05C0,0800,0000,1209
 U 1209, 0019,2000,05C0,0800,0000,120A
 U 120A, 0019,2000,05C0,0800,0000,120B
 U 120B, 0019,2000,05C0,0800,0000,120C
 U 120C, 0019,2000,05C0,0800,0000,120D
 U 120D, 0019,2000,05C0,0800,0000,120E
 U 120E, 0019,2000,05C0,0800,0000,120F
 U 120F, 0019,2000,05C0,0800,0000,1210
 U 1210, 0019,2000,05C0,0800,0000,1211
 U 1211, 0019,2000,05C0,0800,0000,1212
 U 1212, 0019,2000,05C0,0800,0000,1213
 U 1213, 0019,2000,05C0,0800,0000,1214
 U 1214, 0019,2000,05C0,0800,0000,1215
 U 1215, 0019,2000,05C0,0800,0000,1216
 U 1216, 0019,2000,05C0,0800,0000,1217
 U 1217, 0019,2000,05C0,0800,0000,1218
 U 1218, 0019,2000,05C0,0800,0000,1219
 U 1219, 0019,2000,05C0,0800,0000,121A
 U 121A, 0019,2000,05C0,0800,0000,121B
 U 121B, 0019,2000,05C0,0800,0000,121C
 U 121C, 0019,2000,05C0,0800,0000,121D
 U 121D, 0019,2000,05C0,0800,0000,121E
 U 121E, 0019,2000,05C0,0800,0000,121F
 U 121F, 0019,2000,05C0,0800,0000,1220
 U 1220, 0019,2000,05C0,0800,0000,1221
 U 1221, 0019,2000,05C0,0800,0000,1222
 U 1222, 0019,2000,05C0,0800,0000,1223
 U 1223, 0019,2000,05C0,0800,0000,1224
 U 1224, 0019,2000,05C0,0800,0000,1225
 U 1225, 0019,2000,05C0,0800,0000,1226
 U 1226, 0019,2000,05C0,0800,0000,1227

U 1227.	0019.2000.05C0.0800.0000.1228	:2066	1227:	Q-Q-K[.1]
U 1228.	0019.2000.05C0.0800.0000.1229	:2067	1228:	Q-Q-K[.1]
U 1229.	0019.2000.05C0.0800.0000.122A	:2068	1229:	Q-Q-K[.1]
U 122A.	0019.2000.05C0.0800.0000.122B	:2069	122A:	Q-Q-K[.1]
U 122B.	0019.2000.05C0.0800.0000.122C	:2070	122B:	Q-Q-K[.1]
U 122C.	0019.2000.05C0.0800.0000.122D	:2071	122C:	Q-Q-K[.1]
U 122D.	0019.2000.05C0.0800.0000.122E	:2072	122D:	Q-Q-K[.1]
U 122E.	0019.2000.05C0.0800.0000.122F	:2073	122E:	Q-Q-K[.1]
U 122F.	0019.2000.05C0.0800.0000.1230	:2074	122F:	Q-Q-K[.1]
U 1230.	0019.2000.05C0.0800.0000.1231	:2075	1230:	Q-Q-K[.1]
U 1231.	0019.2000.05C0.0800.0000.1232	:2076	1231:	Q-Q-K[.1]
U 1232.	0019.2000.05C0.0800.0000.1233	:2077	1232:	Q-Q-K[.1]
U 1233.	0019.2000.05C0.0800.0000.1234	:2078	1233:	Q-Q-K[.1]
U 1234.	0019.2000.05C0.0800.0000.1235	:2079	1234:	Q-Q-K[.1]
U 1235.	0019.2000.05C0.0800.0000.1236	:2080	1235:	Q-Q-K[.1]
U 1236.	0019.2000.05C0.0800.0000.1237	:2081	1236:	Q-Q-K[.1]
U 1237.	0019.2000.05C0.0800.0000.1238	:2082	1237:	Q-Q-K[.1]
U 1238.	0019.2000.05C0.0800.0000.1239	:2083	1238:	Q-Q-K[.1]
U 1239.	0019.2000.05C0.0800.0000.123A	:2084	1239:	Q-Q-K[.1]
U 123A.	0019.2000.05C0.0800.0000.123B	:2085	123A:	Q-Q-K[.1]
U 123B.	0019.2000.05C0.0800.0000.123C	:2086	123B:	Q-Q-K[.1]
U 123C.	0019.2000.05C0.0800.0000.123D	:2087	123C:	Q-Q-K[.1]
U 123D.	0019.2000.05C0.0800.0000.123E	:2088	123D:	Q-Q-K[.1]
U 123E.	0019.2000.05C0.0800.0000.123F	:2089	123E:	Q-Q-K[.1]
U 123F.	0019.2000.05C0.0800.0000.1240	:2090	123F:	Q-Q-K[.1]
U 1240.	0019.2000.05C0.0800.0000.1241	:2091	1240:	Q-Q-K[.1]
U 1241.	0019.2000.05C0.0800.0000.1242	:2092	1241:	Q-Q-K[.1]
U 1242.	0019.2000.05C0.0800.0000.1243	:2093	1242:	Q-Q-K[.1]
U 1243.	0019.2000.05C0.0800.0000.1244	:2094	1243:	Q-Q-K[.1]
U 1244.	0019.2000.05C0.0800.0000.1245	:2095	1244:	Q-Q-K[.1]
U 1245.	0019.2000.05C0.0800.0000.1246	:2096	1245:	Q-Q-K[.1]
U 1246.	0019.2000.05C0.0800.0000.1247	:2097	1246:	Q-Q-K[.1]
U 1247.	0019.2000.05C0.0800.0000.1248	:2098	1247:	Q-Q-K[.1]
U 1248.	0019.2000.05C0.0800.0000.1249	:2099	1248:	Q-Q-K[.1]
U 1249.	0019.2000.05C0.0800.0000.124A	:2100	1249:	Q-Q-K[.1]
U 124A.	0019.2000.05C0.0800.0000.124B	:2101	124A:	Q-Q-K[.1]
U 124B.	0019.2000.05C0.0800.0000.124C	:2102	124B:	Q-Q-K[.1]
U 124C.	0019.2000.05C0.0800.0000.124D	:2103	124C:	Q-Q-K[.1]
U 124D.	0019.2000.05C0.0800.0000.124E	:2104	124D:	Q-Q-K[.1]
U 124E.	0019.2000.05C0.0800.0000.124F	:2105	124E:	Q-Q-K[.1]
U 124F.	0019.2000.05C0.0800.0000.1250	:2106	124F:	Q-Q-K[.1]
U 1250.	0019.2000.05C0.0800.0000.1251	:2107	1250:	Q-Q-K[.1]
U 1251.	0019.2000.05C0.0800.0000.1252	:2108	1251:	Q-Q-K[.1]
U 1252.	0019.2000.05C0.0800.0000.1253	:2109	1252:	Q-Q-K[.1]
U 1253.	0019.2000.05C0.0800.0000.1254	:2110	1253:	Q-Q-K[.1]
U 1254.	0019.2000.05C0.0800.0000.1255	:2111	1254:	Q-Q-K[.1]
U 1255.	0019.2000.05C0.0800.0000.1256	:2112	1255:	Q-Q-K[.1]
U 1256.	0019.2000.05C0.0800.0000.1257	:2113	1256:	Q-Q-K[.1]
U 1257.	0019.2000.05C0.0800.0000.1258	:2114	1257:	Q-Q-K[.1]
U 1258.	0019.2000.05C0.0800.0000.1259	:2115	1258:	Q-Q-K[.1]
U 1259.	0019.2000.05C0.0800.0000.125A	:2116	1259:	Q-Q-K[.1]
U 125A.	0019.2000.05C0.0800.0000.125B	:2117	125A:	Q-Q-K[.1]
U 125B.	0019.2000.05C0.0800.0000.125C	:2118	125B:	Q-Q-K[.1]
U 125C.	0019.2000.05C0.0800.0000.125D	:2119	125C:	Q-Q-K[.1]
U 125D.	0019.2000.05C0.0800.0000.125E	:2120	125D:	Q-Q-K[.1]

U 125E,	0019,2000,05C0,0800,0000,125F	:2121	125E:	Q-Q-K[.1]
U 125F,	0019,2000,05C0,0800,0000,1260	:2122	125F:	Q-Q-K[.1]
U 1260,	0019,2000,05C0,0800,0000,1261	:2123	1260:	Q-Q-K[.1]
U 1261,	0019,2000,05C0,0800,0000,1262	:2124	1261:	Q-Q-K[.1]
U 1262,	0019,2000,05C0,0800,0000,1263	:2125	1262:	Q-Q-K[.1]
U 1263,	0019,2000,05C0,0800,0000,1264	:2126	1263:	Q-Q-K[.1]
U 1264,	0019,2000,05C0,0800,0000,1265	:2127	1264:	Q-Q-K[.1]
U 1265,	0019,2000,05C0,0800,0000,1266	:2128	1265:	Q-Q-K[.1]
U 1266,	0019,2000,05C0,0800,0000,1267	:2129	1266:	Q-Q-K[.1]
U 1267,	0019,2000,05C0,0800,0000,1268	:2130	1267:	Q-Q-K[.1]
U 1268,	0019,2000,05C0,0800,0000,1269	:2131	1268:	Q-Q-K[.1]
U 1269,	0019,2000,05C0,0800,0000,126A	:2132	1269:	Q-Q-K[.1]
U 126A,	0019,2000,05C0,0800,0000,126B	:2133	126A:	Q-Q-K[.1]
U 126B,	0019,2000,05C0,0800,0000,126C	:2134	126B:	Q-Q-K[.1]
U 126C,	0019,2000,05C0,0800,0000,126D	:2135	126C:	Q-Q-K[.1]
U 126D,	0019,2000,05C0,0800,0000,126E	:2136	126D:	Q-Q-K[.1]
U 126E,	0019,2000,05C0,0800,0000,126F	:2137	126E:	Q-Q-K[.1]
U 126F,	0019,2000,05C0,0800,0000,1270	:2138	126F:	Q-Q-K[.1]
U 1270,	0019,2000,05C0,0800,0000,1271	:2139	1270:	Q-Q-K[.1]
U 1271,	0019,2000,05C0,0800,0000,1272	:2140	1271:	Q-Q-K[.1]
U 1272,	0019,2000,05C0,0800,0000,1273	:2141	1272:	Q-Q-K[.1]
U 1273,	0019,2000,05C0,0800,0000,1274	:2142	1273:	Q-Q-K[.1]
U 1274,	0019,2000,05C0,0800,0000,1275	:2143	1274:	Q-Q-K[.1]
U 1275,	0019,2000,05C0,0800,0000,1276	:2144	1275:	Q-Q-K[.1]
U 1276,	0019,2000,05C0,0800,0000,1277	:2145	1276:	Q-Q-K[.1]
U 1277,	0019,2000,05C0,0800,0000,1278	:2146	1277:	Q-Q-K[.1]
U 1278,	0019,2000,05C0,0800,0000,1279	:2147	1278:	Q-Q-K[.1]
U 1279,	0019,2000,05C0,0800,0000,127A	:2148	1279:	Q-Q-K[.1]
U 127A,	0019,2000,05C0,0800,0000,127B	:2149	127A:	Q-Q-K[.1]
U 127B,	0019,2000,05C0,0800,0000,127C	:2150	127B:	Q-Q-K[.1]
U 127C,	0019,2000,05C0,0800,0000,127D	:2151	127C:	Q-Q-K[.1]
U 127D,	0019,2000,05C0,0800,0000,127E	:2152	127D:	Q-Q-K[.1]
U 127E,	0019,2000,05C0,0800,0000,127F	:2153	127E:	Q-Q-K[.1]
U 127F,	0019,2000,05C0,0800,0000,1280	:2154	127F:	Q-Q-K[.1]
U 1280,	0019,2000,05C0,0800,0000,1281	:2155	1280:	Q-Q-K[.1]
U 1281,	0019,2000,05C0,0800,0000,1282	:2156	1281:	Q-Q-K[.1]
U 1282,	0019,2000,05C0,0800,0000,1283	:2157	1282:	Q-Q-K[.1]
U 1283,	0019,2000,05C0,0800,0000,1284	:2158	1283:	Q-Q-K[.1]
U 1284,	0019,2000,05C0,0800,0000,1285	:2159	1284:	Q-Q-K[.1]
U 1285,	0019,2000,05C0,0800,0000,1286	:2160	1285:	Q-Q-K[.1]
U 1286,	0019,2000,05C0,0800,0000,1287	:2161	1286:	Q-Q-K[.1]
U 1287,	0019,2000,05C0,0800,0000,1288	:2162	1287:	Q-Q-K[.1]
U 1288,	0019,2000,05C0,0800,0000,1289	:2163	1288:	Q-Q-K[.1]
U 1289,	0019,2000,05C0,0800,0000,128A	:2164	1289:	Q-Q-K[.1]
U 128A,	0019,2000,05C0,0800,0000,128B	:2165	128A:	Q-Q-K[.1]
U 128B,	0019,2000,05C0,0800,0000,128C	:2166	128B:	Q-Q-K[.1]
U 128C,	0019,2000,05C0,0800,0000,128D	:2167	128C:	Q-Q-K[.1]
U 128D,	0019,2000,05C0,0800,0000,128E	:2168	128D:	Q-Q-K[.1]
U 128E,	0019,2000,05C0,0800,0000,128F	:2169	128E:	Q-Q-K[.1]
U 128F,	0019,2000,05C0,0800,0000,1290	:2170	128F:	Q-Q-K[.1]
U 1290,	0019,2000,05C0,0800,0000,1291	:2171	1290:	Q-Q-K[.1]
U 1291,	0019,2000,05C0,0800,0000,1292	:2172	1291:	Q-Q-K[.1]
U 1292,	0019,2000,05C0,0800,0000,1293	:2173	1292:	Q-Q-K[.1]
U 1293,	0019,2000,05C0,0800,0000,1294	:2174	1293:	Q-Q-K[.1]
U 1294,	0019,2000,05C0,0800,0000,1295	:2175	1294:	Q-Q-K[.1]

ZZ-ESKAH-V132 Subroutines
ESKAH33.MCR

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SEQ 0789
Page 5

U 1295.	0019.2000.05C0.0800.0000.1296	:2176	1295:	Q-Q-K[.1]
U 1296.	0019.2000.05C0.0800.0000.1297	:2177	1296:	Q-Q-K[.1]
U 1297.	0019.2000.05C0.0800.0000.1298	:2178	1297:	Q-Q-K[.1]
U 1298.	0019.2000.05C0.0800.0000.1299	:2179	1298:	Q-Q-K[.1]
U 1299.	0019.2000.05C0.0800.0000.129A	:2180	1299:	Q-Q-K[.1]
U 129A.	0019.2000.05C0.0800.0000.129B	:2181	129A:	Q-Q-K[.1]
U 129B.	0019.2000.05C0.0800.0000.129C	:2182	129B:	Q-Q-K[.1]
U 129C.	0019.2000.05C0.0800.0000.129D	:2183	129C:	Q-Q-K[.1]
U 129D.	0019.2000.05C0.0800.0000.129E	:2184	129D:	Q-Q-K[.1]
U 129E.	0019.2000.05C0.0800.0000.129F	:2185	129E:	Q-Q-K[.1]
U 129F.	0019.2000.05C0.0800.0000.12A0	:2186	129F:	Q-Q-K[.1]
U 12A0.	0019.2000.05C0.0800.0000.12A1	:2187	12A0:	Q-Q-K[.1]
U 12A1.	0019.2000.05C0.0800.0000.12A2	:2188	12A1:	Q-Q-K[.1]
U 12A2.	0019.2000.05C0.0800.0000.12A3	:2189	12A2:	Q-Q-K[.1]
U 12A3.	0019.2000.05C0.0800.0000.12A4	:2190	12A3:	Q-Q-K[.1]
U 12A4.	0019.2000.05C0.0800.0000.12A5	:2191	12A4:	Q-Q-K[.1]
U 12A5.	0019.2000.05C0.0800.0000.12A6	:2192	12A5:	Q-Q-K[.1]
U 12A6.	0019.2000.05C0.0800.0000.12A7	:2193	12A6:	Q-Q-K[.1]
U 12A7.	0019.2000.05C0.0800.0000.12A8	:2194	12A7:	Q-Q-K[.1]
U 12A8.	0019.2000.05C0.0800.0000.12A9	:2195	12A8:	Q-Q-K[.1]
U 12A9.	0019.2000.05C0.0800.0000.12AA	:2196	12A9:	Q-Q-K[.1]
U 12AA.	0019.2000.05C0.0800.0000.1155	:2197	12AA:	Q-Q-K[.1]
U 1155.	0019.2000.05C0.0800.0000.12AB	:2198	1155:	Q-Q-K[.1],J/12AB
		:2199		
U 12AB.	0019.2000.05C0.0800.0000.12AC	:2200	12AB:	Q-Q-K[.1]
U 12AC.	0019.2000.05C0.0800.0000.12AD	:2201	12AC:	Q-Q-K[.1]
U 12AD.	0019.2000.05C0.0800.0000.12AE	:2202	12AD:	Q-Q-K[.1]
U 12AE.	0019.2000.05C0.0800.0000.12AF	:2203	12AE:	Q-Q-K[.1]
U 12AF.	0019.2000.05C0.0800.0000.12B0	:2204	12AF:	Q-Q-K[.1]
U 12B0.	0019.2000.05C0.0800.0000.12B1	:2205	12B0:	Q-Q-K[.1]
U 12B1.	0019.2000.05C0.0800.0000.12B2	:2206	12B1:	Q-Q-K[.1]
U 12B2.	0019.2000.05C0.0800.0000.12B3	:2207	12B2:	Q-Q-K[.1]
U 12B3.	0019.2000.05C0.0800.0000.12B4	:2208	12B3:	Q-Q-K[.1]
U 12B4.	0019.2000.05C0.0800.0000.12B5	:2209	12B4:	Q-Q-K[.1]
U 12B5.	0019.2000.05C0.0800.0000.12B6	:2210	12B5:	Q-Q-K[.1]
U 12B6.	0019.2000.05C0.0800.0000.12B7	:2211	12B6:	Q-Q-K[.1]
U 12B7.	0019.2000.05C0.0800.0000.12B8	:2212	12B7:	Q-Q-K[.1]
U 12B8.	0019.2000.05C0.0800.0000.12B9	:2213	12B8:	Q-Q-K[.1]
U 12B9.	0019.2000.05C0.0800.0000.12BA	:2214	12B9:	Q-Q-K[.1]
U 12BA.	0019.2000.05C0.0800.0000.12BB	:2215	12BA:	Q-Q-K[.1]
U 12BB.	0019.2000.05C0.0800.0000.12BC	:2216	12BB:	Q-Q-K[.1]
U 12BC.	0019.2000.05C0.0800.0000.12BD	:2217	12BC:	Q-Q-K[.1]
U 12BD.	0019.2000.05C0.0800.0000.12BE	:2218	12BD:	Q-Q-K[.1]
U 12BE.	0019.2000.05C0.0800.0000.12BF	:2219	12BE:	Q-Q-K[.1]
U 12BF.	0019.2000.05C0.0800.0000.12C0	:2220	12BF:	Q-Q-K[.1]
U 12C0.	0019.2000.05C0.0800.0000.12C1	:2221	12C0:	Q-Q-K[.1]
U 12C1.	0019.2000.05C0.0800.0000.12C2	:2222	12C1:	Q-Q-K[.1]
U 12C2.	0019.2000.05C0.0800.0000.12C3	:2223	12C2:	Q-Q-K[.1]
U 12C3.	0019.2000.05C0.0800.0000.12C4	:2224	12C3:	Q-Q-K[.1]
U 12C4.	0019.2000.05C0.0800.0000.12C5	:2225	12C4:	Q-Q-K[.1]
U 12C5.	0019.2000.05C0.0800.0000.12C6	:2226	12C5:	Q-Q-K[.1]
U 12C6.	0019.2000.05C0.0800.0000.12C7	:2227	12C6:	Q-Q-K[.1]
U 12C7.	0019.2000.05C0.0800.0000.12C8	:2228	12C7:	Q-Q-K[.1]
U 12C8.	0019.2000.05C0.0800.0000.12C9	:2229	12C8:	Q-Q-K[.1]
U 12C9.	0019.2000.05C0.0800.0000.12CA	:2230	12C9:	Q-Q-K[.1]

: GETS ECO'D TO 1155

U	12CA.	0019.	2000.	05C0.	0800.	0000.	12CB	:	2231	12CA:	Q-Q-K[.1]
U	12CB.	0019.	2000.	05C0.	0800.	0000.	12CC	:	2232	12CB:	Q-Q-K[.1]
U	12CC.	0019.	2000.	05C0.	0800.	0000.	12CD	:	2233	12CC:	Q-Q-K[.1]
U	12CD.	0019.	2000.	05C0.	0800.	0000.	12CE	:	2234	12CD:	Q-Q-K[.1]
U	12CE.	0019.	2000.	05C0.	0800.	0000.	12CF	:	2235	12CE:	Q-Q-K[.1]
U	12CF.	0019.	2000.	05C0.	0800.	0000.	12D0	:	2236	12CF:	Q-Q-K[.1]
U	12D0.	0019.	2000.	05C0.	0800.	0000.	12D1	:	2237	12D0:	Q-Q-K[.1]
U	12D1.	0019.	2000.	05C0.	0800.	0000.	12D2	:	2238	12D1:	Q-Q-K[.1]
U	12D2.	0019.	2000.	05C0.	0800.	0000.	12D3	:	2239	12D2:	Q-Q-K[.1]
U	12D3.	0019.	2000.	05C0.	0800.	0000.	12D4	:	2240	12D3:	Q-Q-K[.1]
U	12D4.	0019.	2000.	05C0.	0800.	0000.	12D5	:	2241	12D4:	Q-Q-K[.1]
U	12D5.	0019.	2000.	05C0.	0800.	0000.	12D6	:	2242	12D5:	Q-Q-K[.1]
U	12D6.	0019.	2000.	05C0.	0800.	0000.	12D7	:	2243	12D6:	Q-Q-K[.1]
U	12D7.	0019.	2000.	05C0.	0800.	0000.	12D8	:	2244	12D7:	Q-Q-K[.1]
U	12D8.	0019.	2000.	05C0.	0800.	0000.	12D9	:	2245	12D8:	Q-Q-K[.1]
U	12D9.	0019.	2000.	05C0.	0800.	0000.	12DA	:	2246	12D9:	Q-Q-K[.1]
U	12DA.	0019.	2000.	05C0.	0800.	0000.	12DB	:	2247	12DA:	Q-Q-K[.1]
U	12DB.	0019.	2000.	05C0.	0800.	0000.	12DC	:	2248	12DB:	Q-Q-K[.1]
U	12DC.	0019.	2000.	05C0.	0800.	0000.	12DD	:	2249	12DC:	Q-Q-K[.1]
U	12DD.	0019.	2000.	05C0.	0800.	0000.	12DE	:	2250	12DD:	Q-Q-K[.1]
U	12DE.	0019.	2000.	05C0.	0800.	0000.	12DF	:	2251	12DE:	Q-Q-K[.1]
U	12DF.	0019.	2000.	05C0.	0800.	0000.	12E0	:	2252	12DF:	Q-Q-K[.1]
U	12E0.	0019.	2000.	05C0.	0800.	0000.	12E1	:	2253	12E0:	Q-Q-K[.1]
U	12E1.	0019.	2000.	05C0.	0800.	0000.	12E2	:	2254	12E1:	Q-Q-K[.1]
U	12E2.	0019.	2000.	05C0.	0800.	0000.	12E3	:	2255	12E2:	Q-Q-K[.1]
U	12E3.	0019.	2000.	05C0.	0800.	0000.	12E4	:	2256	12E3:	Q-Q-K[.1]
U	12E4.	0019.	2000.	05C0.	0800.	0000.	12E5	:	2257	12E4:	Q-Q-K[.1]
U	12E5.	0019.	2000.	05C0.	0800.	0000.	12E6	:	2258	12E5:	Q-Q-K[.1]
U	12E6.	0019.	2000.	05C0.	0800.	0000.	12E7	:	2259	12E6:	Q-Q-K[.1]
U	12E7.	0019.	2000.	05C0.	0800.	0000.	12E8	:	2260	12E7:	Q-Q-K[.1]
U	12E8.	0019.	2000.	05C0.	0800.	0000.	12E9	:	2261	12E8:	Q-Q-K[.1]
U	12E9.	0019.	2000.	05C0.	0800.	0000.	12EA	:	2262	12E9:	Q-Q-K[.1]
U	12EA.	0019.	2000.	05C0.	0800.	0000.	12EB	:	2263	12EA:	Q-Q-K[.1]
U	12EB.	0019.	2000.	05C0.	0800.	0000.	12EC	:	2264	12EB:	Q-Q-K[.1]
U	12EC.	0019.	2000.	05C0.	0800.	0000.	12ED	:	2265	12EC:	Q-Q-K[.1]
U	12ED.	0019.	2000.	05C0.	0800.	0000.	12EE	:	2266	12ED:	Q-Q-K[.1]
U	12EE.	0019.	2000.	05C0.	0800.	0000.	12EF	:	2267	12EE:	Q-Q-K[.1]
U	12EF.	0019.	2000.	05C0.	0800.	0000.	12F0	:	2268	12EF:	Q-Q-K[.1]
U	12F0.	0019.	2000.	05C0.	0800.	0000.	12F1	:			

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: THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
: CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
: IS COMPLETELY FULL OF DATA.
:
: BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.

```

[illegible]

U 1313.	3000.003C	.0180	.6000	.0000	.1314
U 1314.	0000.003C	.0180	.F800	.0000	.1315
U 1315.	0000.003C	.0180	.F800	.0000	.1316
U 1316.	0000.003C	.0180	.F800	.0000	.1317
U 1317.	0000.003C	.0180	.F800	.0000	.1318
U 1318.	0000.003C	.0180	.F800	.0000	.1319
U 1319.	1000.003E	.0180	.F800	.0000	.0001


```

:2306 .PAGE 'TEST 110 INSTRUCTION BUFFER STALL'
:2307 *****
:2308 ++
:2309 TEST 110 INSTRUCTION BUFFER STALL
:2310
:2311 TEST DESCRIPTION
:2312 THIS TEST FLUSHES THE INSTRUCTION BUFFER, (IT DOES NOT START IT,
:2313 SO ALL BYTES WILL REMAIN INVALID), AND EXECUTES THE SPECIFIER
:2314 SUBROUTINE CALL. SINCE THE STALL SIGNAL ON IRC SHOULD BE ASCERTED,
:2315 THE SERVICE BITS FROM THE ICL MODULE AND THE OTHER BITS FROM THE
:2316 IRC MODULE SHOULD CAUSE ADDRESS 7E TO BE ASCERTED.
:2317
:2318 LOGIC DESCRIPTION
:2319 THIS TEST CHECKS THAT THE SERVICE BIT MULTIPLEXOR ON THE ICL
:2320 MODULE IS DISABLED, AND THAT THE STALL+SVC SIGNAL AND UPC MULTIPLEXOR
:2321 ON THE IRC MODULE ARE ENABLED.
:2322
:2323 ERROR DESCRIPTION
:2324 DATA: EXPECTED MICRO PC BITS<7:0>
:2325 RECEIVED MICRO PC BITS<7:0>
:2326
:2327 SYNC POINT DESCRIPTION
:2328 ADDRESS SYNC00 - UPC FROM INSTRUCTION BUFFER IS ENABLED
:2329 ADDRESS SYNC01 - INSTRUCTION BUFFER FLUSHES
:2330 --
:2331 *****
:2332 =0
:2333 T110: NEWTST
:2334 NOP
:2335 =0 D 0,CALL,J/DC7 ; GENERATE THE EXPECTED VALUE
:2336 RC[0F],K[.2] ; TWO ARGUMENTS
:2337 =0 CALL,J7DCE ; IN THE D REG
:2338 RC[0E],D ; SAVE FOR TYPEOUT
:2339
:2340 =0
:2341 :////////////////////
:2342 :+
:2343 : START THE TEST
:2344 :-
:2345
:2346 T110S1: ERLOOP
:2347 D RC[0E],IBC/STOP ; RELOAD D REG
:2348 SYNC01: A[U 0(K),FLUSH.IB ; LOAD ADDRESS 0 AND INIT Ibuff
:2349 =0 CALL,J/DISPAT ; EXECUTE THE CALL
:2350 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE RESULT
:2351 Z? ; BRANCH IF OK
:2352 =0 ERROR1,RC[0D],Q ; RD[D] CONTAINS ERROR ADDRESS
:2353 NOP
:2354
:2355

```

U 1008, 0000,003D,0180,0800,0000,11DF
U 1009, 0000,003C,0180,0800,0000,100A
U 100A, 0F00,003D,0180,0800,0000,11FF
U 100B, 0018,0038,0980,09F8,0000,100C
U 100C, 0000,003D,0180,0800,0000,1306
U 100D, 0001,003C,0180,09F0,0000,1010

U 1010, 0000,003D,0180,0800,0000,11F3
U 1011, 1810,0038,0180,0970,0000,131A
U 131A, 2018,0038,1980,0800,4200,1012
U 1012, 0000,003D,0180,0800,0000,1312
U 1013, 001D,A000,0180,0800,0010,131B
U 131B, 0000,013C,0180,0800,0000,1014
U 1014, 0001,203D,0180,09E8,0000,11F4
U 1015, 0000,003C,0180,0800,0000,1016

```

:2356 PAGE 'TEST 111 A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF'
:2357 *****
:2358 ++
:2359 TEST 111 A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF
:2360
:2361 TEST DESCRIPTION
:2362 SUBTST 1 - LOAD BYTE 0 OF THE INSTRUCTION BUFFER WITH THE OPCODES
:2363 OF 00,01,02,03,04, AND 05 AND EXECUTE THE SUB/SPEC FUNCTION
:2364 TO CHECK THAT THESE OPCODES ARE DECODED PROPERLY.
:2365 THE EXPECTED ADDRESS STARTS AT 8F (FOR OPCODE 00) AND
:2366 IS DECREMENTED EACH TIME THRU THE LOOP.
:2367 SUBTST 2 - LOAD BYTE 0 OF THE INSTRUCTION BUFFER WITH FF AND
:2368 EXECUTE THE SUB/SPEC FUNCTION TO CHECK THAT AN OPCODE
:2369 OF FF IS DECODED CORRECTLY.
:2370
:2371 LOGIC DESCRIPTION
:2372 BOTH SUBTESTS USE THE CONTENTS OF THE VAX DECODE ROMS, THE
:2373 'DECODE ADDRESS' GATES, AND THE UPC MULTIPLEXOR ON IRC. IMPLICITLY
:2374 CHECKED IS BYTE 0 OF THE BYTE SHIFTER ON IDP, AND
:2375 THE BYTE 0 LATCH ON IRC.
:2376
:2377 ERROR DESCRIPTION
:2378 EXPECTED MICRO PC BITS<7:0>
:2379 RECEIVED MICRO PC BITS<7:0>
:2380 LOOP COUNT OF SUBTST 1--STARTS AT 6
:2381
:2382 SYNC POINT DESCRIPTION
:2383 ADDRESS SYNC02 - BYTE ZERO GETS LATCHED FROM THE CACHE
:2384 ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO UPC LINES
:2385 --
:2386 *****
:2387 =0
:2388 T111: NEWTST
:2389 RC[0F] K[.3],BYTE ; TWO ARGUMENTS FOR TYPEOUT
:2390 =0 D K[.8],CALL,J/DCF ; GENERATE DISPAT ADR FOR OPCODE 00
:2391 RC[0E] D ; SAVE
:2392 =0 D K[.8],CALL,J/DC3 ; GEN DISPAT ADR FOR OPCODE FF
:2393 RC[0] D ; SAVE
:2394 RC[1]_0 ; SET ADDRESS OF IB DATA
:2395
:2396 //////////////////////////////////////
:2397 +
:2398 FIRST CHECK OPCODE 00 THRU OPCODE 05
:2399 -
:2400
:2401 =0
:2402 T111S1: SUBTEST
:2403 RC[0C] K[.6] ; SET THE LOOP COUNT
:2404 =0 ERLOOP-
:2405 T111L1: D RC[0E] ; PUT EXPECTED ADDRESS IN D REGISTER
:2406 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2407 NOP
:2408 =0 CALL,J/DISPAT ; EXECUTE THE A FORK
:2409 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
:2410 Z?

```

U 1016, 0000,003D,0180,0800,0000,11DF
 U 1017, 0018,8038,0D80,09F8,0000,1018
 U 1018, 0818,0039,0180,0800,0000,1307
 U 1019, 0001,003C,0180,09F0,0000,101A
 U 101A, 0818,0039,0180,0800,0000,11FB
 U 101B, 0001,003C,0180,0A80,0000,131C
 U 131C, 0003,003C,0180,0A88,0000,101C

U 101C, 0000,003D,0180,0800,0000,130D
 U 101D, 0018,0038,0580,09E0,0000,1020
 U 1020, 0000,003D,0180,0800,0000,11F3
 U 1021, 0810,0038,0180,0970,0000,1022
 U 1022, 2000,003D,0180,0A08,4200,1313
 U 1023, 0000,003C,0180,0800,0000,1024
 U 1024, 0000,003D,0180,0800,0000,1312
 U 1025, 001D,A000,0180,0800,0010,131D
 U 131D, 0000,013C,0180,0800,0000,1026

```

U 1026, 0001,203D,0180,09E8,0000,11F6 :2411 =0 ERROR2,RC[0D]_Q ; OPCODE 00 FAILED
U 1027, 0800,003C,0180,0A08,0000,131E :2412 D RC[1] ; GET ADDRESS OF IB DATA
U 131E, 0019,0014,1180,0A88,0000,131F :2413 RC[1] D+K[.4] ; INCREMENT TO NEXT OP CODE
U 131F, 0810,0038,0180,0970,0000,1320 :2414 D RC[0E] ; GET CURRENT EXPECTED ADDRESS
U 1320, 0019,0000,0580,09F0,0000,1321 :2415 RC[0E] D-K[.1] ; DECREMENT TO NEXT EXPECTED ADDRESS
U 1321, 0810,0038,0180,0960,0000,1322 :2416 D RC[0C] ; GET THE LOOP COUNT
U 1322, 0019,8000,0580,09E0,0010,1323 :2417 RC[0C] D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT AND CHECK
U 1323, 0000,013C,0180,0800,0000,1028 :2418 Z?
U 1028, 0000,003C,0180,0800,0000,1021 :2419 =0 J/T111L1 ; CONTINUE
:2420
:2421 :////////////////////
:2422 :+
:2423 : NOW CHECK OPCODE FF
:2424 :-
:2425
U 1029, 0000,003C,0180,0A00,0000,102A :2426 T111S2: LAB RC[0]
U 102A, 0000,003D,0180,0800,0000,130D :2427 =0 SUBTEST
U 102B, 0000,003C,0180,09F0,0000,102C :2428 RC[0E]_LA ; GET EXPECTED ADDRESS
U 102C, 0000,003D,0180,0800,0000,11F3 :2429 =0 ERLOOP
U 102D, 0810,0038,0180,0970,0000,1030 :2430 D RC[0E] ; GET EXPECTED ADDRESS
U 1030, 2000,003D,0180,0A08,4200,1313 :2431 =0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1031, 0000,003C,0180,0800,0000,1032 :2432 NOP
U 1032, 0000,003D,0180,0800,0000,1312 :2433 =0 CALL,J/DISPAT ; EXECUTE THE A FORK
U 1033, 001D,A000,0180,0800,0010,1324 :2434 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
U 1324, 0000,013C,0180,0800,0000,1034 :2435 Z?
U 1034, 0001,203D,0180,09E8,0000,11F6 :2436 =0 ERROR2,RC[0D]_Q ; OPCODE FF FAILED
U 1035, 0000,003C,0180,0800,0000,1036 :2437 NOP
:2438
:2439
:2440 : FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2441 :% 0
:2442 : SUBTST 1
:2443 :$ 0000,0000
:2444 :$ 0101,0101
:2445 :$ 0202,0202
:2446 :$ 0303,0303
:2447 :$ 0404,0404
:2448 :$ 0505,0505
:2449 :
:2450 : SUBTST 2
:2451 :$ FFFF,FFFF
:2452
:2453
    
```

U 1036, 0018,0039,0980,09F8,0000,11DF
U 1037, 0018,0038,7580,0A88,0000,1038
U 1038, 0818,0039,0580,0800,0000,1304
U 1039, 0001,003C,0180,0A80,0000,103A

U 103A, 0000,003D,0180,0800,0000,130D
U 103B, 0000,003C,0180,0A00,0200,1325

```

:2454 .PAGE "TEST 112      BYTE 0 SHIFT CONTROL"
:2455 *****
:2456 **
:2457 .TEST 112      BYTE 0 SHIFT CONTROL
:2458
:2459 .TEST DESCRIPTION
:2460 THIS TEST CHECKS THE SELECT LINES OF THE
:2461 SHIFTER ON BYTE 0. THIS IS DONE BY
:2462 LOADING ALL BYTES OF THE IB WITH AN OPCODE OF FF EXCEPT THE BYTE
:2463 THAT WILL GET SHIFTED INTO BYTE 0 WHICH GETS LOADED WITH AN
:2464 OPCODE OF 00.
:2465
:2466 SUBTST 1 - CHECK FOR NO SHIFT WHILE EXECUTING A START FUNCTION
:2467 SUBTST 2 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTE 1 FUNCTION
:2468 SUBTST 3 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTE 2,3 FUNCTION
:2469 SUBTST 4 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTES 1-5 CONDITIONAL
:2470 FUNCTION.
:2471 SUBTST 5 - CHECK THAT BYTE 0 GETS BYTE 1 WHEN EXECUTING A CLR
:2472 BYTE 0 FUNCTION.
:2473 SUBTST 6 - CHECK THAT BYTE 0 GETS BYTE 2 WHEN EXECUTING A CLR
:2474 BYTE 0,1 FUNCTION.
:2475 SUBTST 7 - CHECK THAT BYTE 0 GETS BYTE 4 WHEN EXECUTING A CLR
:2476 BYTE 0-3 FUNCTION.
:2477
:2478 .ERROR DESCRIPTION
:2479 EXPECTED MICRO PC BITS <7:0>
:2480 RECEIVED MICRO PC BITS <7:0>
:2481
:2482 .SYNC POINT DESCRIPTION
:2483 ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO THE UPC LINES AT THE
:2484 INSTRUCTION AFTER THIS INSTRUCTION.
:2485 SUBTST 1 - SYNC03--START FUNCTION IS EXECUTED
:2486 SUBTST 2 - SYNC04--CLR BYTE 1 FUNCTION IS EXECUTED
:2487 SUBTST 3 - SYNC05--CLR BYTE 2,3 FUNCTION IS EXECUTED
:2488 SUBTST 4 - SYNC06--CLR BYTES 1-5 CONDITIONAL FUNCTION IS EXECUTED
:2489 SUBTST 5 - SYNC07--CLR BYTE 0 FUNCTION IS EXECUTED
:2490 SUBTST 6 - SYNC08--CLR BYTES 0,1 FUNCTION IS EXECUTED
:2491 SUBTST 7 - SYNC09--CLR BYTES 0-3 FUNCTION IS EXECUTED
:2492 --
:2493 *****
:2494
:2495 =0
:2496 T112: NEWTST[.2]
:2497 R[1]_K[.20] ; SET ADDRESS OF IB DATA
:2498 =0 D_K[.1],CALL,J/DCC ; GENERATE ADDRESS OF EXPECTED DATA
:2499 R[0]_D ; SAVE IN R0
:2500
:2501 //////////////////////////////////////
:2502 +
:2503 .BYTE 0 NO SHIFT---START FUNCTION
:2504 -
:2505
:2506 =0
:2507 T112S1: SUBTEST
:2508 VA_R[0] ; LOAD ADDRESS OF EXP DATA

```



```

U 1325, 0000,803C,0180,C800,0000,1326 :2509
U 1326, 0019,0034,4980,09F0,0000,103C :2510
U 103C, 0000,003D,0180,0800,0000,11F3 :2511
U 103D, 0810,0038,0180,0970,0000,1040 :2512
U 1040, 2000,003D,0180,0A08,4200,1313 :2513
U 1041, 1000,003C,0180,0800,0000,1042 :2514
:2515
U 1042, 3000,003D,0180,0800,0000,1312 :2516
U 1043, 1000,003C,0180,0800,0000,1327 :2517
U 1327, 001D,A000,0180,0800,0010,1328 :2518
U 1328, 0000,013C,0180,0800,0000,1044 :2519
U 1044, 0001,A03D,0180,09E8,0000,11F6 :2520
U 1045, 0000,003C,0180,0800,0000,1046 :2521
:2522
:2523
:2524
:2525
:2526
:2527
U 1046, 0000,003D,0180,0800,0000,130D :2528
U 1047, 0000,003C,0180,0800,0000,1048 :2529
:2530
U 1048, 0000,003D,0180,0800,0000,11F3 :2531
U 1049, 0810,0038,0180,0970,0000,104A :2532
U 104A, 2000,003D,0180,0A08,4200,1313 :2533
U 104B, 1000,003C,0180,0800,0000,104C :2534
:2535
U 104C, D000,003D,0180,0800,0000,1312 :2536
U 104D, 001D,A000,0180,0800,0010,1329 :2537
U 1329, 0000,013C,0180,0800,0000,1050 :2538
U 1050, 0001,A03D,0180,09E8,0000,11F6 :2539
U 1051, 0000,003C,0180,0800,0000,1052 :2540
:2541
:2542
:2543
:2544
:2545
:2546
U 1052, 0000,003D,0180,0800,0000,130D :2547
U 1053, 0000,003C,0180,0800,0000,1054 :2548
:2549
U 1054, 0000,003D,0180,0800,0000,11F3 :2550
U 1055, 0810,0038,0180,0970,0000,1056 :2551
U 1056, 2000,003D,0180,0A08,4200,1313 :2552
U 1057, 1000,003C,0180,0800,0000,1058 :2553
:2554
U 1058, 5000,003D,0180,0800,0000,1312 :2555
U 1059, 001D,A000,0180,0800,0010,132A :2556
U 132A, 0000,013C,0180,0800,0000,105C :2557
U 105C, 0001,A03D,0180,09E8,0000,11F6 :2558
U 105D, 0000,003C,0180,0800,0000,1060 :2559
:2560
:2561
:2562
:2563

```

```

D[BYTE] CACHE.P ; READ THE EXPECTED DATA
RC[OE]_D.AND.K[FF] ; SAVE IN RC[E]
=0 ERLOOP
D RC[OE] ; RESTORE D REG
=0 A[U,RC[1]],FLUSH.IB,CALL,J/IBWAIT ; FETCH THE OP CODE
IBC7STOP
=0
SYNC03: IBC/START,CALL,J/DISPAT ; EXECUTE THE TEST FUNCTION
IBC/STOP
ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
Z? ; BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
NOP
:////////////////////
:
: +
: BYTE 0 NO SHIFT---CLR.1 FUNCTION
: -
=0 SUBTEST
NOP
=0
T112S2: ERLOOP
D RC[OE] ; GET EXPECTED ADDRESS
=0 A[U,RC[1]],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
IBC7STOP
=0
SYNC04: IBC/CLR.1,CALL,J/DISPAT ; EXECUTE THE TEST FUNCTION
ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE RESULT
Z? ; BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
NOP
:////////////////////
:
: +
: BYTE 0 NO SHIFT---CLEAR 2,3 FUNCTION
: -
=0 SUBTEST
NOP
=0
T112S3: ERLOOP
D RC[OE] ; GET EXPECTED DATA
=0 A[U,RC[1]],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
IBC7STOP
=0
SYNC05: IBC/CLR.2,3,CALL,J/DISPAT ; EXECUTE THE TEST FUNCTION
ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z? ; BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
NOP
:////////////////////
:
: +

```

```

:2564 ; BYTE 0 NO SHIFT---CLEAR.1-5.COND FUNCTION
:2565 :-
:2566
U 1060, 0000,003D,0180,0800,0000,130D :2567 =0 SUBTEST
U 1061, 0000,003C,0180,0800,0000,1062 :2568 NOP
:2569
:2570 T112S4: ERLOOP
:2571 D RC[0E] ; GET EXPECTED DATA
U 1062, 0000,003D,0180,0800,0000,11F3 :2572 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1063, 0810,0038,0180,0970,0000,1064 :2573 IBC7STOP
U 1064, 2000,003D,0180,0A08,4200,1313 :2574
U 1065, 1000,003C,0180,0800,0000,1066 :2575 SYNC06: IBC/CLR.1-5.COND,CALL,J/DISPAT ; EXECUTE THE TEST INSTRUCTION
:2576 ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
:2577 Z? ; BRANCH IF OK
U 1066, F000,003D,0180,0800,0000,1312 :2578 =0 ERROR2,RC[0D]_Q,BYTE
U 1067, 001D,A000,0180,0800,0010,132B :2579
U 132B, 0000,013C,0180,0800,0000,1068 :2580 ;////////////////////
U 1068, 0001,A03D,0180,09E8,0000,11F6 :2581 ;+
:2582 ; BYTE 0 ONE SHIFT---CLR.0 FUNCTION
:2583 :-
:2584
U 1069, 0000,003C,0180,0A08,0000,106A :2585 T112S5: LAB RC[1]
U 106A, 0000,003D,0180,0800,0000,130D :2586 =0 SUBTEST
U 106B, 0018,0014,0180,0A88,0000,1070 :2587 RC[1]_LA+K[.8] ; SELECT ADDRESS OF NEXT OP CODE
U 1070, 0000,003D,0180,0800,0000,11F3 :2588 =0 ERLOOP
U 1071, 0810,0038,0180,0970,0000,1072 :2589 D RC[0E] ; GET EXPECTED ADDRESS
U 1072, 2000,003D,0180,0A08,4200,1313 :2590 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1073, 1000,003C,0180,0800,0000,1074 :2591 IBC7STOP
:2592 =0
:2593 SYNC07: IBC/CLR.0,CALL,J/DISPAT ; EXECUTE THE TEST INSTRUCTION
:2594 ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
:2595 Z? ; BRANCH IF OK
U 1074, C000,003D,0180,0800,0000,1312 :2596 =0 ERROR2,RC[0D]_Q,BYTE
U 1075, 001D,A000,0180,0800,0010,132C :2597
U 132C, 0000,013C,0180,0800,0000,1076 :2598 ;////////////////////
U 1076, 0001,A03D,0180,09E8,0000,11F6 :2599 ;+
:2600 ; BYTE 0 TWO SHIFT---CLR.0.1 FUNCTION
:2601 :-
:2602
U 1077, 0000,003C,0180,0A08,0000,1078 :2603 T112S6: LAB RC[1] ; GEN ADDRESS OF OP CODE
U 1078, 0000,003D,0180,0800,0000,130D :2604 =0 SUBTEST
U 1079, 0018,0014,0180,0A88,0000,107A :2605 RC[1]_LA+K[.8] ; ...
U 107A, 0000,003D,0180,0800,0000,11F3 :2606 =0 ERLOOP
U 107B, 0810,0038,0180,0970,0000,1080 :2607 D RC[0E] ; GET EXPECTED DATA
U 1080, 2000,003D,0180,0A08,4200,1313 :2608 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1081, 1000,003C,0180,0800,0000,1082 :2609 IBC7STOP
:2610 =0
:2611 SYNC08: IBC/CLR.0.1,CALL,J/DISPAT ; EXECUTE THE FUNCTION
:2612 ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
:2613 Z? ; BRANCH IF OK
U 1082, 4000,003D,0180,0800,0000,1312 :2614 =0 ERROR2,RC[0D]_Q,BYTE
U 1083, 001D,A000,0180,0800,0010,132D :2615
U 132D, 0000,013C,0180,0800,0000,1084 :2616 ;////////////////////
U 1084, 0001,A03D,0180,09E8,0000,11F6 :2617 ;+
:2618 ; BYTE 0 FOUR SHIFT---CLR.0-3 FUNCTION

```

```

:2619 :-
:2620
U 1085, 0000,003C,0180,0A08,0000,1086 :2621 T112S7: LAB R[1] ; GEN ADDRESS OF OP CODE
U 1086, 0000,003D,0180,0800,0000,130D :2622 =0 SUBTEST
U 1087, 0018,0014,0180,0A88,0000,1088 :2623 R[1] LA+K[.8] ; ...
U 1088, 0000,003D,0180,0800,0000,11F3 :2624 =0 ERLOOP
U 1089, 0810,0038,0180,0970,0000,108A :2625 D RC[OE] ; GET EXPECTED ADDRESS
U 108A, 2000,003D,0180,0A08,4200,1313 :2626 =0 A[U R[1]],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 108B, 1000,003C,0180,0800,0000,108C :2627 IBC7STOP
:2628 =0
:2629 SYNC09: IBC/CLR.0-3,CALL,J/DISPAT ; EXECUTE THE FUNCTION
U 108C, E000,003D,0180,0800,0000,1312 :2630 ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
U 108D, 001D,A000,0180,0800,0010,132E :2631 Z? ; BRANCH IF OK
U 132E, 0000,013C,0180,0800,0000,108E :2632 =0 ERROR2,RC[OD]_Q,BYTE ;
U 108E, 0001,A03D,0180,09E8,0000,11F6 :2633 NOP
U 108F, 0000,003C,0180,0800,0000,1090 :2634
:2635
:2636 ;+
:2637 ; FOLLOWING IS THE EXPECTED DISPATCH ADDRESS FOR THE ABOVE TEST:
:2638 :-
:2639 :X 1C
:2640 :$ 8F
:2641 ;+
:2642 ; FOLLOWING ARE THE OP CODES FOR THE ABOVE TEST:
:2643 :-
:2644
:2645 :X 20
:2646 : SUBTESTS 1,2,3, AND 4
:2647 :$ 4000,FFFF,FFFF,FFFF
:2648
:2649 : SUBTEST 5
:2650 :$ 00FF,FFFF,FFFF,FFFF
:2651
:2652 : SUBTEST 6
:2653 :$ FFFF,FF00,FFFF,FFFF
:2654
:2655 : SUBTEST 7
:2656 :$ FFFF,FFFF,FF00,FFFF
:2657
:2658

```

```

:2659 .PAGE 'TEST 113      BYTE 1 SHIFT CONTROL'
:2660 *****
:2661 ++
:2662 .TEST 113      BYTE 1 SHIFT CONTROL
:2663
:2664 .TEST DESCRIPTION
:2665     THIS TEST CHECKS THE SHIFTER SELECT LOGIC FOR BYTE 1 BY LOADING
:2666     THE IB WITH A DATA PATTERN, EXECUTING A FUNCTION, AND THEN CHECKING
:2667     THAT BYTE 1 RECEIVED THE CORRECT DATA. THE DATA PATTERNS THAT ARE
:2668     LOADED INTO THE IB ARE SELECTED TO CREATE SPECIFIC CONDITIONS OF THE
:2669     SIGNALS THAT GENERATE THE SHIFTER SELECTS. EACH SUBTST HEADER
:2670     DESCRIBES THE EXPECTED STATE OF THESE SIGNALS.
:2671
:2672     SUBTST 1 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
:2673     FUNCTION AND THE 'SAVE' SIGNAL IS ASCERTED.
:2674     SUBTST 2 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
:2675     FUNCTION AND 'DELTA PC 2' IS ASCERTED.
:2676     SUBTST 3 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
:2677     FUNCTION AND PC 1 EN B ACTIVE.
:2678     SUBTST 4 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
:2679     FUNCTION AND 'PC 1 EN A' IS ASCERTED.
:2680     SUBTST 5 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 0 FUNCTION.
:2681     SUBTST 6 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 1 FUNCTION.
:2682     SUBTST 7 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 1-5 CONDITIONAL
:2683     FUNCTION.
:2684     SUBTST 8 - CHECK BYTE 1 GETS BYTE 3 WITH A CLR BYTE 0,1 FUNCTION.
:2685     SUBTST 9 - CHECK BYTE 1 GETS BYTE 5 WITH A CLR BYTE 0-3 FUNCTION.
:2686
:2687 .LOGIC DESCRIPTION
:2688     THIS TEST CHECKS THE LOGIC ON IDP THAT GENERATES THE SELECT
:2689     SIGNALS FOR THE BYTE SHIFTERS. IT ALSO CHECKS THE LOGIC THAT
:2690     DECODES THE IB CONTROL FIELD AND 'DELTA PC' SIGNALS ON IDP.
:2691
:2692 .ERROR DESCRIPTION
:2693     DATA: EXPECTED UPC BITS<7:0> FROM THE IB
:2694     RECEIVED UPC BITS<7:0> FROM THE IB
:2695
:2696 .SYNC POINT DESCRIPTION
:2697     ADDRESS SYNC00 - INSTRUCTION THAT EXECUTES THE SUB/SPEC FUNCTION
:2698     SUBTST 1 - SYNC10--CLR 1-5 CONDITIONAL AND SAVE IS ASCERTED
:2699     SUBTST 2 - SYNC11--CLR 1-5 CONDITIONAL AND AND DELTA PC 2 IS ASCERTED
:2700     SUBTST 3 - SYNC12--CLR 1-5 CONDITIONAL AND PC 1 EN B IS ASCERTED
:2701     SUBTST 4 - SYNC13--CLR 1-5 CONDITIONAL AND PC 1 EN A IS ASCERTED
:2702     SUBTST 5 - SYNC14--CLR BYTE 0 FUNCTION IS ENABLED
:2703     SUBTST 6 - SYNC15--CLR BYTE 1 FUNCTION IS ENABLED
:2704     SUBTST 7 - SYNC16--CLR BYTE 1-5 CONDITIONAL FUNCTION ENABLED
:2705     SUBTST 8 - SYNC17--CLR BYTE 0,1 FUNCTION ENABLED
:2706     SUBTST 9 - SYNC18--CLR BYTE 1-3 FUNCTION ENABLED
:2707
:2708 *****
:2709
:2710 =0
:2711 T113: NEWTST[.2]
:2712      R[0]_K[.40]_D_ALU      ; SET ADDRESS OF EXPECTED DATA
:2713      R[1]_D+K[.4]          ; AND ADDRESS OF OP CODES

```

U 1090, 0018,0039,0980,09F8,0000,11DF
U 1091, 0818,0038,3180,0A80,0000,132F
U 132F, 0019,0014,1180,0A88,0000,1092


```

:2714
:2715 :////////////////////
:2716 :+
:2717 : BYTE 1 NO SHIFT---CLR.1-5.COND*SAVE FUNCTION
:2718 :-
:2719
:2720 =0
:2721 T113S1: SUBTEST
:2722 VA R[0] : LOAD ADDRESS OF EXPECTED DATA
:2723 D[BYTE] CACHE.P : GET EXPECTED DATA
:2724 RC[OE]_D.AND.K[.FF] : SAVE IN RC[E]
:2725 =0
:2726 ERLOOP
:2727 D RC[OE] : GET EXPECTED ADDRESS
:2728 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
:2729 SYNC10: IBC7CLR.1-5.COND : EXECUTE THE TEST INSTRUCTION
:2730 =0 IBC/CLR.0,CALL,J/DISPAT : DO A CALL 3 ON BYTE 1
:2731 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:2732 Z? : BRANCH IF OK
:2733 =0 ERROR2,RC[OD]_Q,BYTE
:2734 :////////////////////
:2735 :+
:2736 : BYTE 1 NO SHIFT---CLR.1-5.COND*DELTA PC 2*-PC 1 EN A*-PC 1 EN B FUNCTION
:2737 :-
:2738
:2739 T113S2: LAB R[1] : INCREMENT OP CODE ADDRESS
:2740 =0 SUBTEST
:2741 R[1]_LA+K[.8] :
:2742 LAB R[0] : AND ADDRESS OF EXPECTED DATA
:2743 RC[0]_LA+K[.1] : ...
:2744
:2745 VA R[0] : LOAD ADDRESS OF EXP DATA
:2746 D[BYTE] CACHE.P : READ EXPECTED DATA
:2747 RC[OE]_D.AND.K[.FF] : SAVE
:2748 =0
:2749 ERLOOP
:2750 D RC[OE] : PUT EXPECTED DATA IN D REG
:2751 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD OP CODE
:2752 SYNC11: IBC7CLR.1-5.COND : EXECUTE TEST FUNCTION
:2753 =0 IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 1
:2754 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:2755 Z? : BRANCH IF OK
:2756 =0 ERROR2,RC[OD]_Q,BYTE
:2757 :////////////////////
:2758 :+
:2759 : BYTE 1 NO SHIFT---CLR.1-5.COND*-DELTA PC 2*-PC 1 EN A*PC 1 EN B
:2760 :-
:2761
:2762 T113S3: LAB R[1] : INCREMENT ADDRESS OF OP CODE
:2763 =0 SUBTEST
:2764 R[1]_LA+K[.8] : ...
:2765
:2766 =0 ERLOOP
:2767 D RC[OE] : GET EXPECTED ADDRESS
:2768 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE

```

U 1092, 0000,003D,0180,0800,0000,130D
U 1093, 0000,003C,0180,0A00,0200,1330
U 1330, 0000,803C,0180,C800,0000,1331
U 1331, 0019,0034,4980,09F0,0000,1094
U 1094, 0000,003D,0180,0800,0000,11F3
U 1095, 0810,0038,0180,0970,0000,1096
U 1096, 2000,003D,0180,0A08,4200,1313
U 1097, F000,003C,0180,0800,0000,1098
U 1098, C000,003D,0180,0800,0000,1312
U 1099, 001D,A000,0180,0800,0010,1332
U 1332, 0000,013C,0180,0800,0000,109A
U 109A, 0001,A03D,0180,09E8,0000,11F6

U 1098, 0000,003C,0180,0A08,0000,109C
U 109C, 0000,003D,0180,0800,0000,130D
U 109D, 0018,0014,0180,0A88,0000,1333
U 1333, 0000,003C,0180,0A00,0000,1334
U 1334, 0018,0014,0580,0A80,0000,1335

U 1335, 0000,003C,0180,0A00,0200,1336
U 1336, 0000,803C,0180,C800,0000,1337
U 1337, 0019,0034,4980,09F0,0000,109E
U 109E, 0000,003D,0180,0800,0000,11F3
U 109F, 0810,0038,0180,0970,0000,10A0
U 10A0, 2000,003D,0180,0A08,4200,1313
U 10A1, F000,003C,0180,0800,0000,10A2
U 10A2, C000,003D,0180,0800,0000,1312
U 10A3, 001D,A000,0180,0800,0010,1338
U 1338, 0000,013C,0180,0800,0000,10A4
U 10A4, 0001,A03D,0180,09E8,0000,11F6

U 10A5, 0000,003C,0180,0A08,0000,10A6
U 10A6, 0000,003D,0180,0800,0000,130D
U 10A7, 0018,0014,0180,0A88,0000,10A8

U 10A8, 0000,003D,0180,0800,0000,11F3
U 10A9, 0810,0038,0180,0970,0000,10AA
U 10AA, 2000,003D,0180,0A08,4200,1313

```

U 10AB, F000,003C,0180,0800,0000,10AC :2769
U 10AC, C000,003D,0180,0800,0000,1312 :2770
U 10AD, 001D,A000,0180,0800,0010,1339 :2771
U 1339, 0000,013C,0180,0800,0000,10AE :2772
U 10AE, 0001,A03D,0180,09E8,0000,11F6 :2773
:2774
:2775
:2776
:2777
:2778
:2779
U 10AF, 0000,003C,0180,0A08,0000,10B0 :2780
U 10B0, 0000,003D,0180,0800,0000,130D :2781
U 10B1, 0018,0014,0180,0A88,0000,10B2 :2782
U 10B2, 0000,003D,0180,0800,0000,11F3 :2783
U 10B3, 0810,0038,0180,0970,0000,10B4 :2784
U 10B4, 2000,003D,0180,0A08,4200,1313 :2785
U 10B5, F000,003C,0180,0800,0000,10B6 :2786
U 10B6, C000,003D,0180,0800,0000,1312 :2787
U 10B7, 001D,A000,0180,0800,0010,133A :2788
U 133A, 0000,013C,0180,0800,0000,10B8 :2789
U 10B8, 0001,A03D,0180,09E8,0000,11F6 :2790
:2791
:2792
:2793
:2794
:2795
:2796
U 10B9, 0000,003C,0180,0A00,0000,10BA :2797
U 10BA, 0000,003D,0180,0800,0000,130D :2798
U 10BB, 0018,0014,0580,0A80,0000,133B :2799
U 133B, 0000,003C,0180,0A08,0000,133C :2800
U 133C, 0018,0014,0180,0A88,0000,133D :2801
:2802
U 133D, 0000,003C,0180,0A00,0200,133E :2803
U 133E, 0000,803C,0180,C800,0000,133F :2804
U 133F, 0019,0034,4980,09F0,0000,10BC :2805
U 10BC, 0000,003D,0180,0800,0000,11F3 :2806
U 10BD, 0810,0038,0180,0970,0000,10BE :2807
U 10BE, 2000,003D,0180,0A08,4200,1313 :2808
U 10BF, C000,003C,0180,0800,0000,10C0 :2809
U 10C0, C000,003D,0180,0800,0000,1312 :2810
U 10C1, 001D,A000,0180,0800,0010,1340 :2811
U 1340, 0000,013C,0180,0800,0000,10C2 :2812
U 10C2, 0001,A03D,0180,09E8,0000,11F6 :2813
U 10C3, 0000,003C,0180,0800,0000,10C4 :2814
:2815
:2816
:2817
:2818
:2819
:2820
U 10C4, 0000,003D,0180,0800,0000,130D :2821
U 10C5, 0000,003C,0180,0800,0000,10C6 :2822
:2823

```

```

SYNC12: IBC/CLR.1-5.COND : EXECUTE THE TEST FUNCTION
=0 IBC/CLR.0,CALL,J/DISPAT : DO A CALL 3 ON BYTE 1
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[0D]_Q,BYTE :
:
:////////////////////
: +
: BYTE 1 NO SHIFT---CLR.1-5.COND*-DELTA PC 2*PC 1 EN A*-PC 1 EN B
:-
:
T113S4: LAB R[1] : INCREMENT ADDRESS OF OP CODES
=0 SUBTEST :
R[1]_LA+K[.8] : ...
=0 ERLOOP :
D RC[0E] : GET EXPECTED ADDRESS
=0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC13: IBC7CLR.1-5.COND : EXECUTE THE TEST FUNCTION
=0 IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 1
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[0D]_Q,BYTE :
:
:////////////////////
: +
: BYTE 1 ONE SHIFT---CLR.0 FUNCTION
:-
:
T113S5: LAB R[0] : INCREMENT ADDRESS OF EXPECTED DATA
=0 SUBTEST :
R[0]_LA+K[.1] :
LAB R[1] : INCREMENT ADDRESS OF OP CODE
R[1]_LA+K[.8] : ...
:
VA R[0] : LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P : READ THE EXPECTED DATA
RC[0E]_D.AND.K[.FF] : SAVE
=0 ERLOOP :
D RC[0E] : GET EXPECTED DATA
=0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC14: IBC7CLR.0 : EXECUTE THE TEST INSTRUCTION
=0 IBC/CLR.0,CALL,J/DISPAT : DO A CALL 3 ON BYTE 1
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[0D]_Q,BYTE :
NOP :
:
:////////////////////
: +
: BYTE 1 ONE SHIFT---CLR.1 FUNCTION
:-
:
=0 SUBTEST :
=0 NOP :

```

U 10C6, 0000,003D,0180,0800,0000,11F3 :2824
U 10C7, 0810,0038,0180,0970,0000,10C8 :2825
U 10C8, 2000,003D,0180,0A08,4200,1313 :2826
U 10C9, D000,003C,0180,0800,0000,10CA :2827
U 10CA, C000,003D,0180,0800,0000,1312 :2828
U 10CB, 001D,A000,0180,0800,0010,1341 :2829
U 1341, 0000,013C,0180,0800,0000,10CC :2830
U 10CC, 0001,A03D,0180,09E8,0000,11F6 :2831

T113S6: ERLOOP
D_RC[OE]
=0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : GET EXPECTED DATA
SYNC15: IBC7CLR.1 : LOAD THE OP CODE
=0 IBC/CLR.0,CALL,J/DISPAT : EXECUTE THE TEST INSTRUCTION
ALU_Q-D,CLK.UBCC,BYTE : DO A CALL 3 ON BYTE 1
Z? : ADDRESS OK?
=0 ERROR2,RC[OD]_Q,BYTE : BRANCH IF OK

:/-
+
: BYTE 1 ONE SHIFT---CLR.1-5.COND FUNCTION
:-

U 10CD, 0000,003C,0180,0A08,0000,10CE :2838
U 10CE, 0000,003D,0180,0800,0000,130D :2839
U 10CF, 0018,0014,0180,0A88,0000,10D0 :2840
U 10D0, 0000,003D,0180,0800,0000,11F3 :2841
U 10D1, 0810,0038,0180,0970,0000,10D2 :2842
U 10D2, 2000,003D,0180,0A08,4200,1313 :2843
U 10D3, F000,003C,0180,0800,0000,1342 :2844
U 1342, C000,003C,0180,0800,0000,10D4 :2845
U 10D4, C000,003D,0180,0800,0000,1312 :2846
U 10D5, 001D,A000,0180,0800,0010,1343 :2847
U 1343, 0000,013C,0180,0800,0000,10D6 :2848
U 10D6, 0001,A03D,0180,09E8,0000,11F6 :2849
U 10D7, 0000,003C,0180,0800,0000,10D8 :2850

T113S7: LAB_R[1] : INCREMENT ADDRESS OF OP CODE
=0 SUBTEST
R[1] LA+K[.8] : ...
=0 ERLOOP
D_RC[OE] : GET EXPECTED DATA
=0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC16: IBC7CLR.1-5.COND : EXECUTE THE TEST INSTRUCTION
IBC/CLR.0 : SHIFT OVER TO THE HALT INSTRUCTION
=0 IBC/CLR.0,CALL,J/DISPAT : DO A CALL 3 ON BYTE 1
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
NOP

:/-
+
: BYTE 1 TWO SHIFT---CLR.0.1 FUNCTION
:-

U 10D8, 0000,003D,0180,0800,0000,130D :2857
U 10D9, 0000,003C,0180,0800,0000,10DA :2858
U 10DA, 0000,003D,0180,0800,0000,11F3 :2860
U 10DB, 0810,0038,0180,0970,0000,10DC :2861
U 10DC, 2000,003D,0180,0A08,4200,1313 :2862
U 10DD, 4000,003C,0180,0800,0000,10DE :2863
U 10DE, C000,003D,0180,0800,0000,1312 :2864
U 10DF, 001D,A000,0180,0800,0010,1344 :2865
U 1344, 0000,013C,0180,0800,0000,10E0 :2866
U 10E0, 0001,A03D,0180,09E8,0000,11F6 :2867

=0 SUBTEST
NOP
=0
T113S8: ERLOOP
D_RC[OE]
=0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : GET EXPECTED DATA
SYNC17: IBC7CLR.0.1 : LOAD THE OP CODE
=0 IBC/CLR.0,CALL,J/DISPAT : EXECUTE THE TEST INSTRUCTION
ALU_Q-D,CLK.UBCC,BYTE : DO A CALL 3 ON BYTE 1
Z? : ADDRESS OK?
=0 ERROR2,RC[OD]_Q,BYTE : BRANCH IF OK

:/-
+
: BYTE 1 FOUR SHIFT---CLR.0-3 FUNCTION
:-

U 10E1, 0000,003C,0180,0A08,0000,10E2 :2874
U 10E2, 0000,003D,0180,0800,0000,130D :2875
U 10E3, 0018,0014,0180,0A88,0000,10E4 :2876
U 10E4, 0000,003D,0180,0800,0000,11F3 :2877
U 10E5, 0810,0038,0180,0970,0000,10E6 :2878

T113S9: LAB_R[1] : INCREMENT OP CODE ADDRESS
=0 SUBTEST
R[1] LA+K[.8] : ...
=0 ERLOOP
D_RC[OE] : GET EXPECTED DATA

U 10E6, 2000,003D,0180,0A08,4200,1313 :2879
U 10E7, E000,003C,0180,0800,0000,10E8 :2880
U 10E8, C000,003D,0180,0800,0000,1312 :2881
U 10E9, 001D,A000,0180,0800,0010,1345 :2882
U 1345, 0000,013C,0180,0800,0000,10EA :2883
U 10EA, 0001,A03D,0180,09E8,0000,11F6 :2884
U 10EB, 0000,003C,0180,0800,0000,10EC :2885

=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC18: IBC7CLR.0-3 : EXECUTE THE TEST INSTRUCTION
=0 IBC/CLR.0,CALL,J/DISPAT : DO A CALL 3 ON BYTE 1
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[0D]_Q,BYTE :
NOP :

: THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:

:X 40

: RIGHT HAND BYTE IS FOR SUBTST 1, LEFT HAND BYTE IS USED FOR SUBTSTS 2,3, AND 4

: \$ 088F

: RIGHT HAND BYTE IS USED FOR SUBTST 5

: \$ 008F

: THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:

:X 44

: SUBTST 1

: \$ 0000,FFFF,FFFF,FFFF

: SUBTST 2

: \$ 9FD0,FF60,FFFF,0060

: SUBTST 3

: \$ 8F90,60FF,0000,0000

: SUBTST 4

: \$ A090,6060,FFFF,0050

: SUBTST 5 AND 6

: \$ FFFF,FF00,FFFF,FFFF

: SUBTST 7 AND 8

: \$ 60D0,0050,FFFF,FFFF

: SUBTST 9

: \$ FFFF,FFFF,00FF,FFFF

:2912


```

:2913 .PAGE  "TEST 114      BYTE 2-6 SHIFT CONTROL"
:2914 .*****
:2915 .++
:2916 .TEST  114      BYTE 2-6 SHIFT CONTROL
:2917 .
:2918 .TEST DESCRIPTION
:2919 .THIS TEST CHECKS THE SHIFTER SELECT LOGIC BY LOADING THE IB
:2920 .WITH A DATA PATTERN, EXECUTING A FUNCTION, AND THEN CHECKING
:2921 .THAT BYTES 2-6 RECEIVED THE CORRECT DATA. THE DATA PATTERNS
:2922 .THAT ARE LOADED INTO THE IB ARE SELECTED TO CREATE SPECIFIC
:2923 .CONDITIONS OF THE SIGNALS THAT GENERATE THE SHIFTER SELECTS.
:2924 .EACH SUBTEST HEADER DESCRIBES THE EXPECTED STATE OF THESE SIGNALS.
:2925 .
:2926 .SUBTST 1 - START FUNCTION AND THE CLR BYTE 0 FUNCTION
:2927 .SUBTST 2 - BYTE 2-6 NO SHIFT WITH A CLR BYTE 1-5 CONDITIONAL
:2928 .FUNCTION AND SAVE ASCERTED.
:2929 .SUBTST 3 - BYTE 2-6 GETS BYTES 3-7 WITH A CLR BYTE 1 FUNCTION
:2930 .SUBTST 4 - BYTES 2-6 GET BYTES 3-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2931 .FUNCTION AND 'DELTA PC 1' DISABLED.
:2932 .SUBTST 5 - BYTES 2-6 GET BYTES 3-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2933 .FUNCTION WITH 'DELTA PC 0' ENABLED.
:2934 .SUBTST 6 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 0,1 FUNCTION
:2935 .SUBTST 7 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 2,3 FUNCTION
:2936 .SUBTST 8 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2937 .FUNCTION AND 'DELTA PC 0,1, AND 2' ENABLED.
:2938 .SUBTST 9 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2939 .FUNCTION AND 'DELTA PC 0,1 AND PC 1 EN A' ENABLED.
:2940 .SUBTST A - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2941 .FUNCTION AND 'DELTA PC 0,1 AND PC 1 EN B' ENABLED.
:2942 .SUBTST B - BYTES 2-6 GET BYTES 6-7 WITH A CLR 0-3 FUNCTION.
:2943 .SUBTST C - BYTES 2-6 GET BYTES 6-7 WITH A CLR BYTES 1-5 CONDITIONAL
:2944 .FUNCTION WITH 'DELTA PC 0 AND 2' ENABLED.
:2945 .
:2946 .LOGIC DESCRIPTION
:2947 .THIS TEST CHECKS THE LOGIC ON IDP THAT GENERATE THE DELTA PC
:2948 .SIGNALS AND THE PC EN A & B SIGNALS, AND THE LOGIC THAT
:2949 .GENERATES THE SHIFTER SELECT FOR BYTES 2 THRU 6.
:2950 .
:2951 .ERROR DESCRIPTION
:2952 .EXPECTED MICRO PC BITS <7:0>
:2953 .RECEIVED MICRO PC BITS <7:0>
:2954 .LOOP COUNT- INDICATES WHICH BYTE FAILED. I.E. 6 = BYTE 2,
:2955 .5 = BYTE 3, 4 = BYTE 4, 3 = BYTE 5, 2 = BYTE 6,
:2956 .AND 1 = BYTE 7
:2957 .
:2958 .SYNC POINT DESCRIPTION
:2959 .ADDRESS SYNC00--INSTRUCTION WHERE THE SUB/SPEC IS EXECUTED.
:2960 .SUBTST 1 - SYNC19--START FUNCTION EXECUTED
:2961 .SUBTST 1 - SYNC20--CLR BYTE 0 FUNCTION EXECUTED
:2962 .SUBTST 2 - SYNC21--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2963 .SUBTST 3 - SYNC22--CLR BYTE 1 FUNCTION EXECUTED
:2964 .SUBTST 4 - SYNC23--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2965 .SUBTST 5 - SYNC24--CLR BYTES 1-5 CONDITIONALD FUNCTION EXECUTED
:2966 .SUBTST 6 - SYNC25--CLR BYTES 0,1 FUNCTION EXECUTED
:2967 .SUBTST 7 - SYNC26--CLR BYTES 2,3 FUNCTION EXECUTED

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:2968 : SUBTST 8 - SYNC27--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2969 : SUBTST 9 - SYNC28--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2970 : SUBTST 10- SYNC29--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2971 : SUBTST 11- SYNC30--CLR BYTES 0-3 FUNCTION EXECUTED
:2972 : SUBTST 12- SYNC31--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
:2973 :--
:2974 :*****
:2975 :
:2976 =0
U 10EC, 0018,0039,0D80,09F8,0000,11DF :2977 T114: NEWTST[.3]
U 10ED, 0818,0038,4180,0A80,0000,1346 :2978 R[0]_K[.80],D_ALU ; SET ADDRESS OF EXPECTED DATA
U 1346, 0019,0014,1180,0A88,0000,10EE :2979 R[1]_D+K[.4] ; GET ADDRESS OF OP CODES
:2980 :
:2981 :////////////////////
:2982 :+
:2983 : BYTE 2-6 NO SHIFT---START FUNCTION AND ONE SHIFT---CLR.0 FUNCTION
:2984 :-
:2985 :
:2986 =0
U 10EE, 0000,003D,0180,0800,0000,130D :2987 T114S1: SUBTEST
U 10EF, 0000,003C,0180,0800,0000,10F0 :2988 NOP
U 10F0, 0000,003D,0180,0800,0000,11F3 :2989 =0 ERLOOP
U 10F1, 0000,003C,0180,0A00,0200,1347 :2990 VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
U 1347, 0000,803C,0180,C800,0000,1348 :2991 D[BYTE]_CACHE.P ; READ EXPECTED DATA
U 1348, 0019,0034,4980,09F0,0000,1349 :2992 R[0E]_D.AND.K[.FF] ; SAVE
U 1349, 0018,0038,D580,09E0,0000,10F2 :2993 R[0C]_K[.6]
U 10F2, 2000,003D,0180,0A08,4200,1313 :2994 =0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10F3, 3000,003C,0180,0800,0000,134A :2995 SYNC19: IBC7START ; EXECUTE THE TEST INSTRUCTION
U 134A, 1000,003C,0180,0800,0000,134B :2996 IBC/STOP
U 134B, C000,003C,0180,0800,0000,134C :2997 IBC/CLR.0 ; SHIFT BYTE 2 TO BYTE 1
U 134C, 0810,0038,0180,0970,0000,10F4 :2998 T114L1: D_R[0E] ; PUT EXPECTED ADR IN D REG
:2999 =0
U 10F4, C000,003D,0180,0800,0000,1312 :3000 SYNC20: IBC/CLR.0,CALL,J/DISPAT ; SHIFT BYTE 1 TO BYTE 0 AND DO CALL 3
U 10F5, 001D,A000,0180,0800,0010,134D :3001 ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
U 134D, 0000,013C,0180,0800,0000,10F6 :3002 Z? ; BRANCH IF OK
U 10F6, 0001,A03D,0180,09E8,0000,11F6 :3003 =0 ERROR2,R[0D]_Q,BYTE
U 10F7, 0810,0038,0180,0970,0000,134E :3004 D_R[0E] ; GET EXPECTED DATA
U 134E, 0019,0000,0580,09F0,0000,134F :3005 R[0E]_D-K[.1] ; SELECT NEXT VALUE OF EXPECTED DATA
U 134F, 0810,0038,0180,0960,0000,1350 :3006 D_R[0C] ; GET THE LOOP COUNT
U 1350, 0019,8000,0580,09E0,0010,1351 :3007 R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
U 1351, 0000,013C,0180,0800,0000,10F8 :3008 Z? ; BRANCH IF LOOP DONE
U 10F8, 0000,003C,0180,0800,0000,134C :3009 =0 J/T114L1 ; CONTINUE TESTING
:3010 :
:3011 :////////////////////
:3012 :+
:3013 : BYTE 2-6 NO SHIFT---CLR.1-5.COND+SAVE FUNCTION
:3014 :-
:3015 :
:3016 T114S2: LAB R[1] ; INCREMENT ADDRESS OF OP CODES
U 10F9, 0000,003C,0180,0A08,0000,10FA :3017 =0 SUBTEST
U 10FA, 0000,003D,0180,0800,0000,130D :3018 R[1]_LA+K[.8] ; ...
U 10FB, 0018,0014,0180,0A88,0000,10FC :3019
:3020 =0 ERLOOP
U 10FC, 0000,003D,0180,0800,0000,11F3 :3021 VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
U 10FD, 0000,003C,0180,0A00,0200,1352 :3022 D[BYTE]_CACHE.P ; READ EXPECTED DATA
U 1352, 0000,803C,0180,C800,0000,1353

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U 1353, 0019,0034,4980,09F0,0000,1354 :3023
U 1354, 0818,0038,1180,0800,0000,1355 :3024
U 1355, 0019,0014,0980,09E0,0000,10FE :3025
U 10FE, 2000,003D,0180,0A08,4200,1313 :3026
U 10FF, F000,003C,0180,0800,0000,1356 :3027
U 1356, C000,003C,0180,0800,0000,1357 :3028
U 1357, 0810,0038,0180,0970,0000,110A :3029
:3030
U 110A, C000,003D,0180,0800,0000,1312 :3031
U 110B, 001D,A000,0180,0800,0010,1358 :3032
U 1358, 0000,013C,0180,0800,0000,1110 :3033
U 1110, 0001,A03D,0180,09E8,0000,11F6 :3034
U 1111, 0810,0038,0180,0970,0000,1359 :3035
U 1359, 0019,0000,0580,09F0,0000,135A :3036
U 135A, 0810,0038,0180,0960,0000,135B :3037
U 135B, 0019,8000,0580,09E0,0010,135C :3038
U 135C, 0000,013C,0180,0800,0000,1112 :3039
U 1112, 0000,003C,0180,0800,0000,1357 :3040
:3041
:3042
:3043
:3044
:3045
:3046
U 1113, 0000,003C,0180,0A08,0000,1114 :3047
U 1114, 0000,003D,0180,0800,0000,130D :3048
U 1115, 0018,0014,0180,0A88,0000,1116 :3049
:3050
U 1116, 0000,003D,0180,0800,0000,11F3 :3051
U 1117, 0000,003C,0180,0A00,0200,135D :3052
U 135D, 0000,803C,0180,C800,0000,135E :3053
U 135E, 0019,0034,4980,09F0,0000,135F :3054
U 135F, 0818,0038,1180,0800,0000,1360 :3055
U 1360, 0019,0014,0980,09E0,0000,1118 :3056
U 1118, 2000,003D,0180,0A08,4200,1313 :3057
U 1119, D000,003C,0180,0800,0000,1361 :3058
U 1361, 0810,0038,0180,0970,0000,111A :3059
:3060
U 111A, C000,003D,0180,0800,0000,1312 :3061
U 111B, 001D,A000,0180,0800,0010,1362 :3062
U 1362, 0000,013C,0180,0800,0000,111C :3063
U 111C, 0001,A03D,0180,09E8,0000,11F6 :3064
U 111D, 0810,0038,0180,0970,0000,1363 :3065
U 1363, 0019,0000,0580,09F0,0000,1364 :3066
U 1364, 0810,0038,0180,0960,0000,1365 :3067
U 1365, 0019,8000,0580,09E0,0010,1366 :3068
U 1366, 0000,013C,0180,0800,0000,111E :3069
U 111E, 0000,003C,0180,0800,0000,1361 :3070
:3071
:3072
:3073
:3074
:3075
:3076
U 111F, 0000,003C,0180,0A08,0000,1120 :3077

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```

RC[OE] D.AND.K[.FF] ; SAVE
D K[.4] ; SET THE LOOP COUNT = 6
RC[OC] D+K[.2] ; ...
ALU R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
IB7CLR.1-5.COND ; EXECUTE THE TEST INSTRUCTION
IB7CLR.0 ; SHIFT OVER TO BYTE 2
T114L2: D_RC[OE] ; PUT ECP ADR IN D REG
=0 ; DO CALL 3 ON BYTE 2
IBC/CLR.0,CALL,J/DISPAT ; ADDRESS OK?
ALU_Q-D,CLK.UBCC,BYTE ; BRANCH IF OK
Z? ;
=0 ERROR2,RC[OD]_Q,BYTE ;
D_RC[OE] ; GET EXPECTED DATA
RC[OE] D-K[.1] ; SELECT NEXT VALUE OF EXPECTED DATA
D_RC[OC] ; GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
Z? ; BRANCH IF LOOP DONE
=0 J/T114L2 ; CONTINUE TESTING

:////////////////////
:
: +
: BYTE 2-6 ONE SHIFT---CLR.1 FUNCTION
: -
:
T114S3: LAB_R[1] ; SELECT NEXT OP CODE
=0 SUBTEST ; ...
R[1]_LA+K[.8] ;
=0 ERLOOP ;
VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P ; READ EXPECTED DATA
RC[OE] D.AND.K[.FF] ; SAVE
D K[.4] ; SET THE LOOP COUNT = 6
RC[OC] D+K[.2] ; ...
ALU R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
IB7CLR.1 ; EXECUTE THE TEST INSTRUCTION
T114L3: D_RC[OE] ; PUT EXPECTED ADR IN D REG
=0 ; DO CALL 3 ON BYTE 2
IBC/CLR.0,CALL,J/DISPAT ; ADDRESS OK?
ALU_Q-D,CLK.UBCC,BYTE ; BRANCH IF OK
Z? ;
=0 ERROR2,RC[OD]_Q,BYTE ;
D_RC[OE] ; GET EXPECTED DATA
RC[OE] D-K[.1] ; SELECT NEXT VALUE OF EXPECTED DATA
D_RC[OC] ; GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
Z? ; BRANCH IF LOOP DONE
=0 J/T114L3 ; CONTINUE TESTING

:////////////////////
:
: +
: BYTE 2-6 ONE SHIFT---CLR.1-5.COND+-DELTA PC 0 FUNCTION
: -
:
T114S4: LAB_R[1] ; SELECT NEXT OP CODE

```



```

U 1120, 0000,003D,0180,0800,0000,130D :3078
U 1121, 0018,0014,0180,0A88,0000,1122 :3079
:3080
U 1122, 0000,003D,0180,0800,0000,11F3 :3081
U 1123, 0000,003C,0180,0A00,0200,1367 :3082
U 1367, 0000,803C,0180,C800,0000,1368 :3083
U 1368, 0019,0034,4980,09F0,0000,1369 :3084
U 1369, 0818,0038,1180,0800,0000,136A :3085
U 136A, 0019,0014,0580,09E0,0000,1124 :3086
U 1124, 2000,003D,0180,0A08,4200,1313 :3087
U 1125, F000,003C,0180,0800,0000,136B :3088
U 136B, C000,003C,0180,0800,0000,136C :3089
U 136C, 0810,0038,0180,0970,0000,1126 :3090
:3091
U 1126, C000,003D,0180,0800,0000,1312 :3092
U 1127, 001D,A000,0180,0800,0010,136D :3093
U 136D, 0000,013C,0180,0800,0000,1128 :3094
U 1128, 0001,A03D,0180,09E8,0000,11F6 :3095
U 1129, 0810,0038,0180,0970,0000,136E :3096
U 136E, 0019,0000,0580,09F0,0000,136F :3097
U 136F, 0810,0038,0180,0960,0000,1370 :3098
U 1370, 0019,8000,0580,09E0,0010,1371 :3099
U 1371, 0000,013C,0180,0800,0000,112A :3100
U 112A, 0000,003C,0180,0800,0000,136C :3101
:3102
:3103
:3104
:3105
:3106
:3107
U 112B, 0000,003C,0180,0A08,0000,112C :3108
U 112C, 0000,003D,0180,0800,0000,130D :3109
U 112D, 0018,0014,0180,0A88,0000,112E :3110
:3111
U 112E, 0000,003D,0180,0800,0000,11F3 :3112
U 112F, 0000,003C,0180,0A00,0200,1372 :3113
U 1372, 0000,803C,0180,C800,0000,1373 :3114
U 1373, 0019,0034,4980,09F0,0000,1374 :3115
U 1374, 0818,0038,1180,0800,0000,1375 :3116
U 1375, 0019,0014,0980,09E0,0000,1130 :3117
U 1130, 2000,003D,0180,0A08,4200,1313 :3118
U 1131, F000,003C,0180,0800,0000,1376 :3119
U 1376, 0810,0038,0180,0970,0000,1132 :3120
:3121
U 1132, C000,003D,0180,0800,0000,1312 :3122
U 1133, 001D,A000,0180,0800,0010,1377 :3123
U 1377, 0000,013C,0180,0800,0000,1134 :3124
U 1134, 0001,A03D,0180,09E8,0000,11F6 :3125
U 1135, 0810,0038,0180,0970,0000,1378 :3126
U 1378, 0019,0000,0580,09F0,0000,1379 :3127
U 1379, 0810,0038,0180,0960,0000,137A :3128
U 137A, 0019,8000,0580,09E0,0010,137B :3129
U 137B, 0000,013C,0180,0800,0000,1136 :3130
U 1136, 0000,003C,0180,0800,0000,1376 :3131
U 1137, 0000,003C,0180,0800,0000,1138 :3132

=0 SUBTEST
R[1]_LA+K[.8] ; ...

=0 ERLOOP
VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P ; READ EXPECTED DATA
RC[OE] D.AND.K[.FF] ; SAVE
D K[.4] ; SET THE LOOP COUNT = 5
RC[OC] D+K[.1] ; ...
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
SYNC23: IBC7CLR.1-5.COND ; EXECUTE THE TEST INSTRUCTION
IBC/CLR.0 ; SHIFT BYTE 1
T114L4: D_RC[OE] ; PUT EXPEC ADR IN D REG
=0 ; DO CALL 3 ON BYTE 2
IBC/CLR.0,CALL,J/DISPAT ; ADDRESS OK?
ALU_Q-D,CLK.UBCC,BYTE ; BRANCH IF OK
Z? ;
=0 ERROR2,RC[OD]_Q,BYTE ;
D RC[OE] ; GET EXPECTED DATA
RC[OE] D-K[.1] ; SELECT NEXT VALUE OF EXPECTED DATA
D RC[OC] ; GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
Z? ; BRANCH IF LOOP DONE
=0 J/T114L4 ; CONTINUE TESTING

:////////////////////
:
:3104
:3105
:3106
:3107
:3108
:3109
:3110
:3111
:3112
:3113
:3114
:3115
:3116
:3117
:3118
:3119
:3120
:3121
:3122
:3123
:3124
:3125
:3126
:3127
:3128
:3129
:3130
:3131
:3132

T114S5: LAB R[1] ; SELECT NEXT OP CODE
=0 SUBTEST
R[1]_LA+K[.8] ; ...

=0 ERLOOP
VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P ; READ EXPECTED DATA
RC[OE] D.AND.K[.FF] ; SAVE
D K[.4] ; SET THE LOOP COUNT = 6
RC[OC] D+K[.2] ; ...
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
SYNC24: IBC7CLR.1-5.COND ; EXECUTE THE TEST INSTRUCTION
T114L5: D_RC[OE] ; PUT EXPEC ADR IN D REG
=0 ; DO CALL 3 ON BYTE 2
IBC/CLR.0,CALL,J/DISPAT ; ADDRESS OK?
ALU_Q-D,CLK.UBCC,BYTE ; BRANCH IF OK
Z? ;
=0 ERROR2,RC[OD]_Q,BYTE ;
D RC[OE] ; GET EXPECTED DATA
RC[OE] D-K[.1] ; SELECT NEXT VALUE OF EXPECTED DATA
D RC[OC] ; GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
Z? ; BRANCH IF LOOP DONE
=0 J/T114L5 ; CONTINUE TESTING
NOP

```



```

:3133
:3134
:3135 :////////////////////
:3136 :+
:3137 : BYTE 2-6 TWO SHIFT---CLR.0.1 FUNCTION
:3138 :-
:3139
U 1138, 0000,003D,0180,0800,0000,130D :3140 =0 SUBTEST
U 1139, 0000,003C,0180,0800,0000,113A :3141 NOP
:3142 =0
:3143 T114S6: ERLOOP
:3144 VA R[0] : LOAD ADDRESS OF EXPECTED DATA
:3145 D[BYTE] CACHE.P : READ EXPECTED DATA
:3146 RC[OE] D.AND.K[.FF] : SAVE
:3147 D K[.4] : SET THE LOOP COUNT = 6
:3148 RC[OC] D+K[.2] : ...
:3149 =0 ALU R[T],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
:3150 SYNC25: IBC7CLR.0.1 : EXECUTE THE TEST INSTRUCTION
:3151 T114L6: D_RC[OE] : PUT EXP ADR IN D REG
:3152 =0
:3153 CALL,J/DISPAT : DO CALL 3 ON BYTE 2
:3154 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:3155 Z? : BRANCH IF OK
:3156 =0 ERROR2,RC[OD]_Q,BYTE :
:3157 IBC/CLR.0
:3158 D RC[OE] : GET EXPECTED DATA
:3159 RC[OE] D-K[.1] : SELECT NEXT VALUE OF EXPECTED DATA
:3160 D RC[OC] : GET THE LOOP COUNT
:3161 RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
:3162 Z? : BRANCH IF LOOP DONE
:3163 =0 J/T114L6 : CONTINUE TESTING
:3164 :////////////////////
:3165 :+
:3166 : BYTE 2-6 TWO SHIFT---CLR.2.3 FUNCTION
:3167 :-
:3168
U 1143, 0000,003C,0180,0A08,0000,1144 :3170 T114S7: LAB R[1] : SELECT NEXT OP CODE
U 1144, 0000,003D,0180,0800,0000,130D :3171 =0 SUBTEST
U 1145, 0018,0014,0180,0A88,0000,1146 :3172 RC[1]_LA+K[.8] : ...
:3173 =0
:3174 ERLOOP
:3175 VA R[0] : LOAD ADDRESS OF EXPECTED DATA
:3176 D[BYTE] CACHE.P : READ EXPECTED DATA
:3177 RC[OE] D.AND.K[.FF] : SAVE
:3178 RC[OC] K[.4] : SET THE LOOP COUNT = 4
:3179 =0 ALU R[T],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
:3180 SYNC26: IBC7CLR.2.3 : EXECUTE THE TEST INSTRUCTION
:3181 IBC/CLR.0
:3182 T114L7: D_RC[OE] : PUT EXP ADR IN D REG
:3183 =0
:3184 IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
:3185 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:3186 Z? : BRANCH IF OK
:3187 =0 ERROR2,RC[OD]_Q,BYTE :

```

U 114D, 0810,0038,0180,0970,0000,138D :3188
U 138D, 0019,0000,0580,09F0,0000,138E :3189
U 138E, 0810,0038,0180,0960,0000,138F :3190
U 138F, 0019,8000,0580,09E0,0010,1390 :3191
U 1390, 0000,013C,0180,0800,0000,114E :3192
U 114E, 0000,003C,0180,0800,0000,138B :3193

D_RC[OE] : GET EXPECTED DATA
RC[OE]_D-K[.1] : SELECT NEXT VALUE OF EXPECTED DATA
D_RC[OC] : GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
Z? : BRANCH IF LOOP DONE
=0 J/T114L7 : CONTINUE TESTING

:/:-----
+
: BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*DELTA PC 2 FUNCTION
:-

U 114F, 0000,003C,0180,0A08,0000,1150 :3200
U 1150, 0000,003D,0180,0800,0000,130D :3201
U 1151, 0018,0014,0180,0A88,0000,1152 :3202

T114S8: LAB RC[1] : SELECT NEXT OP CODE
=0 SUBTEST :
RC[1]_LA+K[.8] : ...

U 1152, 0000,003D,0180,0800,0000,11F3 :3204
U 1153, 0000,003C,0180,0A00,0200,1391 :3205
U 1391, 0000,803C,0180,C800,0000,1392 :3206
U 1392, 0019,0034,4980,09F0,0000,1393 :3207
U 1393, 0018,0038,1180,09E0,0000,1156 :3208
U 1156, 2000,003D,0180,0A08,4200,1313 :3209
U 1157, F000,003C,0180,0800,0000,1394 :3210
U 1394, C000,003C,0180,0800,0000,1395 :3211
U 1395, 0810,0038,0180,0970,0000,1158 :3212

=0 ERLOOP :
VA RC[0] : LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P : READ EXPECTED DATA
RC[OE]_D.AND.K[.FF] : SAVE
RC[OC]_K[.4] : SET THE LOOP COUNT = 4
=0 ALU RT[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC27: IBC7CLR.1-5.COND : EXECUTE THE TEST INSTRUCTION
IBC/CLR.0
T114L8: D_RC[OE] : PUT EXP ADR IN D REG
=0

U 1158, C000,003D,0180,0800,0000,1312 :3214
U 1159, 001D,A000,0180,0800,0010,1396 :3215
U 1396, 0000,013C,0180,0800,0000,115A :3216
U 115A, 0001,A03D,0180,09E8,0000,11F6 :3217
U 115B, 0810,0038,0180,0970,0000,1397 :3218
U 1397, 0019,0000,0580,09F0,0000,1398 :3219
U 1398, 0810,0038,0180,0960,0000,1399 :3220
U 1399, 0019,8000,0580,09E0,0010,139A :3221
U 139A, 0000,013C,0180,0800,0000,115C :3222
U 115C, 0000,003C,0180,0800,0000,1395 :3223

IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
Z? : BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE :
D_RC[OE] : GET EXPECTED DATA
RC[OE]_D-K[.1] : SELECT NEXT VALUE OF EXPECTED DATA
D_RC[OC] : GET THE LOOP COUNT
RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
Z? : BRANCH IF LOOP DONE
=0 J/T114L8 : CONTINUE TESTING

:/:-----
+
: BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*-DELTA PC 2*PC 1 EN A*-PC
:-

U 115D, 0000,003C,0180,0A08,0000,115E :3230
U 115E, 0000,003D,0180,0800,0000,130D :3231
U 115F, 0018,0014,0180,0A88,0000,1160 :3232

T114S9: LAB RC[1] : SELECT NEXT OP CODE
=0 SUBTEST :
RC[1]_LA+K[.8] : ...

U 1160, 0000,003D,0180,0800,0000,11F3 :3234
U 1161, 0000,003C,0180,0A00,0200,139B :3235
U 139B, 0000,803C,0180,C800,0000,139C :3236
U 139C, 0019,0034,4980,09F0,0000,139D :3237
U 139D, 0018,0038,1180,09E0,0000,1162 :3238
U 1162, 2000,003D,0180,0A08,4200,1313 :3239
U 1163, F000,003C,0180,0800,0000,139E :3240
U 139E, C000,003C,0180,0800,0000,139F :3241
U 139F, 0810,0038,0180,0970,0000,1164 :3242

=0 ERLOOP :
VA RC[0] : LOAD ADDRESS OF EXPECTED DATA
D[BYTE] CACHE.P : READ EXPECTED DATA
RC[OE]_D.AND.K[.FF] : SAVE
RC[OC]_K[.4] : SET THE LOOP COUNT = 4
=0 ALU RT[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC28: IBC7CLR.1-5.COND : EXECUTE THE TEST INSTRUCTION
IBC/CLR.0
T114L9: D_RC[OE] : PUT EXP ADR IN D REG

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U 1164, C000,003D,0180,0800,0000,1312 :3243
U 1165, 001D,A000,0180,0800,0010,13A0 :3244
U 13A0, 0000,013C,0180,0800,0000,1166 :3245
U 1166, 0001,A03D,0180,09E8,0000,11F6 :3246
U 1167, 0810,0038,0180,0970,0000,13A1 :3247
U 13A1, 0019,0000,0580,09F0,0000,13A2 :3248
U 13A2, 0810,0038,0180,0960,0000,13A3 :3249
U 13A3, 0019,8000,0580,09E0,0010,13A4 :3250
U 13A4, 0000,013C,0180,0800,0000,1168 :3251
U 1168, 0000,003C,0180,0800,0000,139F :3252

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:3243 =0 IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
:3244 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:3245 Z? : BRANCH IF OK
:3246
:3247 =0 ERROR2,RC[0D]_Q,BYTE :
:3248 D_RC[OE] : GET EXPECTED DATA
:3249 RC[OE]_D-K[.1] : SELECT NEXT VALUE OF EXPECTED DATA
:3250 D_RC[OC] : GET THE LOOP COUNT
:3251 RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
:3252 Z? : BRANCH IF LOOP DONE
:3253 =0 J/T114L9 : CONTINUE TESTING
:3254
:3255 :////////////////////
:3256 :+
:3257 : BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*-DELTA PC 2*-PC 1 EN A*PC
:3258 :-
:3259
U 1169, 0000,003C,0180,0A08,0000,116A :3260 T114SA: LAB RC[1] : SELECT NEXT OP CODE
U 116A, 0000,003D,0180,0800,0000,130D :3261 =0 SUBTEST
U 116B, 0018,0014,0180,0A88,0000,116C :3262 RC[1]_LA+K[.8] : ...
:3263
:3264 =0 ERLOOP
:3265 VA RC[0] : LOAD ADDRESS OF EXPECTED DATA
:3266 D[BYTE]_CACHE.P : READ EXPECTED DATA
:3267 RC[OE]_D.AND.K[.FF] : SAVE
:3268 RC[OC]_K[.4] : SET THE LOOP COUNT = 4
:3269 =0 ALU RT,FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
:3270 SYNC29: IBC7CLR.1-5.COND : EXECUTE THE TEST INSTRUCTION
:3271 IBC/CLR.0
:3272 T114LA: D_RC[OE] : PUT EXP ADR IN D REG
:3273 =0
:3274 IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
:3275 ALU_Q-D,CLK.UBCC,BYTE : ADDRESS OK?
:3276 Z? : BRANCH IF OK
:3277 =0 ERROR2,RC[0D]_Q,BYTE :
:3278 D_RC[OE] : GET EXPECTED DATA
:3279 RC[OE]_D-K[.1] : SELECT NEXT VALUE OF EXPECTED DATA
:3280 D_RC[OC] : GET THE LOOP COUNT
:3281 RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
:3282 Z? : BRANCH IF LOOP DONE
:3283 =0 J/T114LA : CONTINUE TESTING
:3284
:3285
:3286 :////////////////////
:3287 :+
:3288 : BYTE 2-6 FOUR SHIFT---CLR.0-3 FUNCTION
:3289 :-
:3290
U 1175, 0000,003C,0180,0A08,0000,1176 :3291 T114SB: LAB RC[1] : SELECT NEXT OP CODE
U 1176, 0000,003D,0180,0800,0000,130D :3292 =0 SUBTEST
U 1177, 0018,0014,0180,0A88,0000,1178 :3293 RC[1]_LA+K[.8] : ...
:3294
:3295 =0 ERLOOP
:3296 VA RC[0] : LOAD ADDRESS OF EXPECTED DATA
:3297 D[BYTE]_CACHE.P : READ EXPECTED DATA

```


U 13B0, 0019,0034,4980,09F0,0000,13B1 :3298
U 13B1, 0018,0038,0980,09E0,0000,117A :3299
U 117A, 2C00,003D,0180,0A08,4200,1313 :3300
U 117B, E000,003C,0180,0800,0000,13B2 :3301
U 13B2, C000,003C,0180,0800,0000,13B3 :3302
U 13B3, 0810,0038,0180,0970,0000,117C :3303
:3304
U 117C, C000,003D,0180,0800,0000,1312 :3305
U 117D, 001D,A000,0180,0800,0010,13B4 :3306
U 13B4, 0000,013C,0180,0800,0000,117E :3307
U 117E, 0001,A03D,0180,09E8,0000,11F6 :3308
U 117F, 0810,0038,0180,0970,0000,13B5 :3309
U 13B5, 0019,0000,0580,09F0,0000,13B6 :3310
U 13B6, 0810,0038,0180,0960,0000,13B7 :3311
U 13B7, 0019,8000,0580,09E0,0010,13B8 :3312
U 13B8, 0000,013C,0180,0800,0000,1180 :3313
U 1180, 0000,003C,0180,0800,0000,13B3 :3314

```
RC[OE]_D.AND.K[.FF]      : SAVE
RC[OC]_K[.2]              : SET THE LOOP COUNT = 2
=0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC30: IBC7CLR.0-3       : EXECUTE THE TEST INSTRUCTION
      IBC/CLR.0
T114LB: D_RC[OE]          : PUT EXP ADR IN D REG
=0
      IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
      ALU_Q-D,CLK.UBCC,BYTE  : ADDRESS OK?
      Z?                     : BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
      D_RC[OE]               : GET EXPECTED DATA
      RC[OE]_D-K[.1]         : SELECT NEXT VALUE OF EXPECTED DATA
      D_RC[OC]               : GET THE LOOP COUNT
      RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
      Z?                     : BRANCH IF LOOP DONE
=0 J/T114LB                : CONTINUE TESTING
```

```
:/::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::/
: +
: BYTE 2-6 FOUR SHIFT---CLR.1-5.COND*DELTA PC 0*-DELTA PC 1*DELTA PC 2*-PC 1 EN A*-P
: -
```

U 1181, 0000,003C,0180,0A08,0000,1182 :3322
U 1182, 0000,003D,0180,0800,0000,130D :3323
U 1183, 0018,0014,0180,0A88,0000,1184 :3324

```
T114SC: LAB_R[1]          : SELECT NEXT OP CODE
=0 SUBTEST
      R[1]_LA+K[.8]        : ...
```

U 1184, 0000,003D,0180,0800,0000,11F3 :3326
U 1185, 0000,003C,0180,0A00,0200,13B9 :3327
U 13B9, 0000,803C,0180,C800,0000,13BA :3328
U 13BA, 0019,0034,4980,09F0,0000,13BB :3329
U 13BB, 0018,0038,0980,09E0,0000,1186 :3330
U 1186, 2000,003D,0180,0A08,4200,1313 :3331
U 1187, F000,003C,0180,0800,0000,13BC :3332
U 13BC, C000,003C,0180,0800,0000,13BD :3333
U 13BD, 0810,0038,0180,0970,0000,1188 :3334

```
=0 ERLOOP
      VA_R[0]               : LOAD ADDRESS OF EXPECTED DATA
      D[BYTE]_CACHE.P       : READ EXPECTED DATA
      RC[OE]_D.AND.K[.FF]    : SAVE
      RC[OC]_K[.2]          : SET THE LOOP COUNT = 2
=0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE OP CODE
SYNC31: IBC7CLR.1-5.COND     : EXECUTE THE TEST INSTRUCTION
      IBC/CLR.0
T114LC: D_RC[OE]            : PUT EXP ADR IN D REG
=0
      IBC/CLR.0,CALL,J/DISPAT : DO CALL 3 ON BYTE 2
      ALU_Q-D,CLK.UBCC,BYTE  : ADDRESS OK?
      Z?                     : BRANCH IF OK
=0 ERROR2,RC[OD]_Q,BYTE
      D_RC[OE]               : GET EXPECTED DATA
      RC[OE]_D-K[.1]         : SELECT NEXT VALUE OF EXPECTED DATA
      D_RC[OC]               : GET THE LOOP COUNT
      RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT AND CHECK
      Z?                     : BRANCH IF LOOP DONE
=0 J/T114LC                : CONTINUE TESTING
```

U 1188, C000,003D,0180,0800,0000,1312 :3336
U 1189, 001D,A000,0180,0800,0010,13BE :3337
U 13BE, 0000,013C,0180,0800,0000,118A :3338
U 118A, 0001,A03D,0180,09E8,0000,11F6 :3339
U 118B, 0810,0038,0180,0970,0000,13BF :3340
U 13BF, 0019,0000,0580,09F0,0000,13C0 :3341
U 13C0, 0810,0038,0180,0960,0000,13C1 :3342
U 13C1, 0019,8000,0580,09E0,0010,13C2 :3343
U 13C2, 0000,013C,0180,0800,0000,118C :3344
U 118C, 0000,003C,0180,0800,0000,13BD :3345
U 118D, 0000,003C,0180,0800,0000,118E :3346

```
NOP
: THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
: X 80
: $ 008F
:
: THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
: X 84
```


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```
:3353 : SUBTST 1  
:3354 : $ 0000,0100,0302,0504  
:3355 : SUBTST 2  
:3356 : $ 5094,0100,0302,0504  
:3357 : SUBTST 3  
:3358 : $ 40D0,0100,0302,0504  
:3359 : SUBTST 4  
:3360 : $ A090,00FF,0201,0403  
:3361 : SUBTST 5 AND 6  
:3362 : $ 9090,0100,0302,0504  
:3363 : SUBTST 7  
:3364 : $ FFFF,FFFF,0100,0302  
:3365 : SUBTST 8  
:3366 : $ C0B0,FFFF,0100,0302  
:3367 : SUBTST 9  
:3368 : $ C0D0,FFFF,0100,0302  
:3369 : SUBTST A  
:3370 : $ 8FB0,FFFF,0100,0302  
:3371 : SUBTST B  
:3372 : $ FFFF,FFFF,FFFF,0100  
:3373 : SUBTST C  
:3374 : $ E0D0,FFFF,FFFF,0100  
:3375
```

```

:3376 .PAGE "TEST 115      BYTE ROTATOR DATA INTEGRITY"
:3377 .*****
:3378 .++
:3379 .TEST 115      BYTE ROTATOR DATA INTEGRITY
:3380 .
:3381 .TEST DESCRIPTION
:3382 .THIS TEST CHECKS THE SELECT LINES AND THE DATA PATH LINES OF
:3383 .THE BYTE ROTATOR. THIS IS DONE BY SETTING THE LOWER TWO BITS
:3384 .OF THE INSTRUCTION BUFFER ADDRESS (IBA) TO VALUES OF 00,01,
:3385 .10, AND 11, ALLOWING THE IB TO FILL WITH A DATA PATTERN, THEN
:3386 .EXECUTING A SUB/SPEC FUNCTION FOR EACH OF THE FIRST FOUR BYTES.
:3387 .
:3388 .THE DATA PATTERNS ARE ALTERNATING BYTES OF ZEROS AND ONES, SO THAT
:3389 .THE DISPATCH ADDRESS SHOULD EITHER BE 8F OR 83.
:3390 .
:3391 .SUBTST 1 - CHECKS VALUES OF IBA<1:0> OF 00,01, AND 11 WITH DATA
:3392 .PATTERNS OF FFOOFF00, 00FF00FF, AND 00FF00FF RESPECTIVELY,
:3393 .WHICH SHOULD ALL BE ROTATED INTO A PATTERN OF FFOOFF00.
:3394 .
:3395 .SUBTST 2 - SAME AS SUB TEST 1 EXCEPT WITH THE COMPLIMENT DATA PATTERN.
:3396 .
:3397 .SUBTST 3 - CHECKS THE IBA BITS<1:0> VALUE OF 10 WITH AN INPUT
:3398 .DATA PATTERN OF 0000FFFF, WHICH SHOULD BE ROTATED INTO
:3399 .A PATTERN OF FFFF0000.
:3400 .
:3401 .SUBTST 4 - SAME AS SUB TEST 3 EXCEPT WITH THE COMPLIMENT DATA PATTERN.
:3402 .
:3403 .LOGIC DESCRIPTION
:3404 .THIS TEST CHECKS THE 25S10 CHIPS THAT MAKE UP THE BYTE ROTATOR ON
:3405 .THE IDP MODULE.
:3406 .
:3407 .ERROR DESCRIPTION
:3408 .DATA: EXPECTED MICRO PC BITS <7:0>
:3409 .RECEIVED MICRO PC BITS <7:0>
:3410 .LOOP COUNT THAT TELLS WHICH BYTE WAS BEING TESTED.
:3411 .4=BYTE 0, 3=BYTE 1, 2=BYTE 2, 1=BYTE 3
:3412 .LOOP COUNT THAT TELLS WHAT THE IBA BITS<1:0> ARE.
:3413 .3=00, 2=01, 1=11 FOR SUBTESTS 1 & 2, NOT USED IN 3 & 4.
:3414 .
:3415 .SYNC POINT DESCRIPTION
:3416 .ADDRESS SYNC02 - CACHE DATA IS LOADED INTO THE BUFFER
:3417 .ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO THE UPC LINES
:3418 .AT THE INSTRUCTION AFTER THIS INSTRUCTION.
:3419 .SUBTST 1 - SYNC32--BYTE 0 OF THE BUFFER IS CLEARED
:3420 .SUBTST 2 - SYNC33--BYTE 0 OF THE BUFFER IS CLEARED
:3421 .SUBTST 3 - SYNC34--BYTE 0 OF THE BUFFER IS CLEARED
:3422 .SUBTST 4 - SYNC35--BYTE 0 OF THE BUFFER IS CLEARED
:3423 .
:3424 .
:3425 .
:3426 T115: NEWTST[.4]
:3427 NOP
:3428 =0 D_K[.F],CALL,J/DC8 ; GEN ADR FOR IB DATA
:3429 R[1] D
:3430 =0 D_K[.8],Q_K[.8],CALL,J/DC3 ; GEN EXP ADR WHEN BYTE 0=FF

```

```

U 118E, 0018,0039,1180,09F8,0000,11DF
U 118F, 0000,003C,0180,0800,0000,1190
U 1190, 0818,0039,6180,0800,0000,1300
U 1191, 0001,003C,0180,0A88,0000,1192
U 1192, 0818,0039,01C0,0800,0000,11FB

```

U 1193, 0C01,003C,0180,0A90,0000,1194 :3431
U 1194, 0000,003D,0180,0800,0000,1307 :3432
U 1195, 0001,003C,0180,0A98,0000,1196 :3433

=0 R[2],D,D,0 :
CALL,J/D[CF] : GEN EXP ADR WHEN BYTE 0=00
R[3],D : ...

////////////////////////////////////

THIS SUBTEST TEST CHECKS IBA<1:0> VALUES OF 00,01, AND 11 WITH A
DATA PATTERN OF ---FF00FF00---

U 1196, 0000,003D,0180,0800,0000,130D :3441
U 1197, 0018,0038,0D80,09D8,0000,1198 :3442
U 1198, 0000,003D,0180,0800,0000,11F3 :3443
U 1199, 0018,0038,1180,09E0,0000,119A :3444
U 119A, 2000,003D,0180,0A08,4200,1313 :3445
U 119B, 0000,003C,0180,0A18,0000,13C3 :3446
U 13C3, 0800,003C,0180,09F0,0000,119C :3447
U 119C, 0000,003D,0180,0800,0000,1312 :3448
U 119D, 001D,A000,0180,0800,0010,13C4 :3449
U 13C4, 0000,013C,0180,0800,0000,119E :3450
U 119E, 0001,A03D,0180,09E8,0000,11F4 :3451

T115S1: SUBTEST :
R[0B],K[.3] ; INIT THE IBA COUNTER
ERLOOP :
T115L3: R[0C],K[.4] ; INIT THE BYTE COUNTER
ALU,R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
T115L1: LAB,R[3] ; GET BYTE 0=00 ADDRESS
T115L2: R[0E],LA,D,LA ; SAVE IN R[E] AND PUT IN D REG
CALL,J7DISPAT ; CHECK A BYTE
ALU,Q-D,CLK.UBCC,BYTE ; ADR OK?
Z? ; BRANCH IF YES
ERROR1,R[0D],Q,BYTE ;

THE FOLLOWING CODE IS LOOP CONTROL FOR SUB TEST 1

U 119F, C810,0038,0180,0960,0000,13C5 :3458
U 13C5, 0819,8000,0580,09E0,0010,13C6 :3459
U 13C6, 0000,013C,0180,0800,0000,11A0 :3460
U 11A0, 0000,003C,0180,0800,0000,13C7 :3461
U 11A1, 0800,003C,0180,0A08,0000,13C8 :3462
U 13C7, 0000,193C,0180,0800,0000,100E :3463
U 100E, 0000,003C,0180,0800,0000,1198 :3464
U 100F, 0000,003C,0180,0A10,0000,13C3 :3465

SYNC32: D,R[0C],IBC/CLR,0 ; GET THE BYTE COUNTER
R[0C],D-K[.1],D,ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
Z? ; BRANCH IF BYTE COUNT DONE
J/T115P1 ; GO COMPLIMENT EXP ADR AND CONT
J/T115P2,D,R[1] ; GO INCREMENT IBA AND CONT
T115P1: D0? ; BRANCH IF TIME TO USE FF ADR
=1110 J/T115L1 ; USE 00 ADDRESS
LAB,R[2],J/T115L2 ; USE FF ADR

U 13C8, 0819,0014,0180,0800,0000,13C9 :3467
U 13C9, 0019,0014,0580,0A88,0000,13CA :3468
U 13CA, 0810,0038,0180,0958,0000,13CB :3469
U 13CB, 0819,8000,0580,09D8,0010,13CC :3470
U 13CC, 0000,013C,0180,0800,0000,11A2 :3471
U 11A2, 0000,003C,0180,0800,0000,13CD :3472
U 11A3, 0000,003C,0180,0800,0000,11A4 :3473

T115P2: D,D+K[.8] ; INCREMENT IB DATA ADR TO NEXT PATTERN
R[1],D+K[.1] ; SELECT NEXT VALUE OF IBA<1:0>
D,R[0B] ; GET THE IBA COUNTER
R[0B],D-K[.1],D,ALU,CLK.UBCC,BYTE ; INCREMENT IBA COUNTER
Z? ; BRANCH IF DONE
J/T115P3 ; GO CHECK IF TIME FOR IBA<1:0>=11
J/T115S2 ; GO TO NEXT SUBTEST

U 13CD, 0000,193C,0180,0A08,0000,101E :3475
U 101E, 0000,003C,0180,0800,0000,1199 :3476
U 101F, 0018,0014,0580,0A88,0000,1199 :3477

T115P3: D0?,LAB,R[1] ; BRANCH IF TIME FOR IBA<1:0>=11
=1110 J/T115L3 ; CONTINUE TESTING
R[1],LA+K[.1],J/T115L3 ; INCREMENT IBA AGAIN

////////////////////////////////////

THIS SUBTEST TEST CHECKS IBA<1:0> VALUES OF 00,01, AND 11 WITH A
DATA PATTERN OF ---00FF00FF---

```

:3486
:3487
U 11A4, 0000,003D,0180,0800,0000,130D :3488
U 11A5, 0018,0038,0D80,09D8,0000,11A6 :3489
U 11A6, 0818,0039,6580,0800,0000,11F8 :3490
U 11A7, 0001,003C,0180,0A88,0000,11A8 :3491
U 11A8, 0000,003D,0180,0800,0000,11F3 :3492
U 11A9, 0018,0038,1180,09E0,0000,11AA :3493
U 11AA, 2000,003D,0180,0A08,4200,1313 :3494
U 11AB, 0000,003C,0180,0A10,0000,13CE :3495
U 13CE, 0800,003C,0180,09F0,0000,11AC :3496
U 11AC, 0000,003D,0180,0800,0000,1312 :3497
U 11AD, 001D,A000,0180,0800,0010,13CF :3498
U 13CF, 0000,013C,0180,0800,0000,11AE :3499
U 11AE, 0001,A03D,0180,09E8,0000,11F4 :3500

:3501
:3502
:3503
:3504
:3505
U 11AF, C810,0038,0180,0960,0000,13D0 :3506
U 13D0, 0819,8000,0580,09E0,0010,13D1 :3507
U 13D1, 0000,013C,0180,0800,0000,11B0 :3508
U 11B0, 0000,003C,0180,0800,0000,13D2 :3509
U 11B1, 0800,003C,0180,0A08,0000,13D3 :3510
U 13D2, 0000,193C,0180,0800,0000,102E :3511
U 102E, 0000,003C,0180,0800,0000,11AB :3512
U 102F, 0000,003C,0180,0A18,0000,13CE :3513

:3514
U 13D3, 0000,003C,5D80,0800,0000,13D4 :3515
U 13D4, 0019,0000,5D80,0A88,0000,13D5 :3516
U 13D5, 0810,0038,0180,0958,0000,13D6 :3517
U 13D6, 0819,8000,0580,09D8,0010,13D7 :3518
U 13D7, 0000,013C,0180,0800,0000,11B2 :3519
U 11B2, 0000,003C,0180,0800,0000,13D8 :3520
U 11B3, 0000,003C,0180,0800,0000,11B4 :3521

:3522
U 13D8, 0000,193C,0180,0A08,0000,103E :3523
U 103E, 0000,003C,0180,0800,0000,11A9 :3524
U 103F, 0018,0014,0580,0A88,0000,11A9 :3525

:3526
:3527
:3528
:3529
:3530
:3531
:3532
:3533
:3534
:3535
U 11B4, 0000,003D,0180,0800,0000,130D :3536
U 11B5, 0000,003C,0180,0800,0000,11B6 :3537
U 11B6, 0000,003D,0D80,0800,0084,730F :3538
U 11B7, 0000,003C,0180,0800,0000,11B8 :3539
U 11B8, 0818,0039,0580,0800,0000,11F9 :3540

:3486
:3487
T115S2: SUBTEST
RC[0B],K[.3] ; INIT THE IBA COUNTER
D,K[.10],CALL,J/DC0 ; SET ADR OF IB DATA
R[1],D
ERLOOP
T115L6: RC[0C],K[.4] ; INIT THE BYTE COUNTER
ALU,R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
T115L4: LAB,R[2] ; GET BYTE 0=FF ADDRESS
T115L5: RC[0E],LA,D,LA ; SAVE IN RC[E] AND PUT IN D REG
CALL,J7DISPAT ; CHECK A BYTE
ALU,Q-D,CLK.UBCC,BYTE ; ADR OK?
Z? ; BRANCH IF YES
ERROR1,RC[0D],Q,BYTE

:3501
:3502
:3503
:3504
:3505
THE FOLLOWING CODE IS LOOP CONTROL FOR SUBTEST 2
:3506
:3507
:3508
:3509
:3510
:3511
:3512
:3513
:3514
:3515
:3516
:3517
:3518
:3519
:3520
:3521
:3522
:3523
:3524
:3525
:3526
:3527
:3528
:3529
:3530
:3531
:3532
:3533
:3534
:3535
:3536
:3537
:3538
:3539
:3540
SYNC33: D,RC[0C],IBC/CLR.0 ; GET THE BYTE COUNTER
RC[0C],D-K[.1],D,ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
Z? ; BRANCH IF BYTE COUNT DONE
J/T115P4 ; GO COMPLIMENT EXP ADR AND CONT
J/T115P5,D,R[1] ; GO INCREMENT IBA AND CONT
T115P4: D0? ; BRANCH IF TIME TO USE 00 ADR
=1110 J/T115L4 ; USE FF ADDRESS
LAB,R[3],J/T115L5 ; USE 00 ADR

T115P5: KMX/.7
R[1],D-K[.7] ; INCREMENT IB DATA ADR TO NEXT PATTERN
D,RC[0B] ; GET THE IBA COUNTER
RC[0B],D-K[.1],D,ALU,CLK.UBCC,BYTE ; INCREMENT IBA COUNTER
Z? ; BRANCH IF DONE
=0 J/T115P6 ; GO CHECK IF TIME FOR IBA<1:0>=11
J/T115S3 ; GO TO NEXT SUBTEST

T115P6: D0?,LAB,R[1] ; BRANCH IF TIME FOR IBA<1:0>=11
=1110 J/T115L6 ; CONTINUE TESTING
R[1],LA+K[.1],J/T115L6 ; INCREMENT IBA AGAIN

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:5141
:5142
```



```

U 11B9, 0000,003C,0180,0800,0000,11BA :3541 NOP
U 11BA, 0000,003D,0180,0800,0000,11FA :3542 =0 CALL,J/DC2
U 11BB, 0001,003C,0180,0A88,0000,11BC :3543 R[1] D
U 11BC, 0000,003D,0180,0800,0000,11F3 :3544 =0 ERLOOP
U 11BD, 0018,0038,1180,09E0,0000,11BE :3545 T115L9: RC[0C] K[.4] : INIT THE BYTE COUNTER
U 11BE, 2000,003D,0180,0A08,4200,1313 :3546 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 11BF, 0000,003C,0180,0A18,0000,13D9 :3547 T115L7: LAB_R[3] : GET BYTE 0=00 ADDRESS
U 13D9, 0800,003C,0180,09F0,0000,11C0 :3548 T115L8: RC[0E] LA,D LA : SAVE IN RC[E] AND PUT IN D REG
U 11C0, 0000,003D,0180,0800,0000,1312 :3549 =0 CALL,J7DISPAT : CHECK A BYTE
U 11C1, 001D,A000,0180,0800,0010,13DA :3550 ALU_Q-D,CLK.UBCC,BYTE : ADR OK?
U 13DA, 0000,013C,0180,0800,0000,11C2 :3551 Z? : BRANCH IF YES
U 11C2, 0001,A03D,0180,09E8,0000,11F4 :3552 =0 ERROR1,RC[0D]_Q,BYTE :
:3553
:3554
:3555 :+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST.
:3556 :-
:3557
U 11C3, C810,0038,0180,0960,0000,13DB :3558 SYNC34: D RC[0C],IBC/CLR.0 : GET THE BYTE COUNTER
U 13DB, 0819,8000,0580,09E0,0010,13DC :3559 RC[0C]_D-K[.1],D_ALU,CLK.UBCC,BYTE : INCREMENT COUNT AND CHECK
U 13DC, 0000,013C,0180,0800,0000,11C4 :3560 Z? : BRANCH IF BYTE COUNT DONE
U 11C4, 0000,003C,0180,0800,0000,13DD :3561 =0 J/T115P7 : GO COMPLIMENT EXP ADR AND CONT
U 11C5, 0000,003C,0180,0800,0000,11C6 :3562 J/T115S4 : GO CHECK COMPLIMENT PATTERN
U 13DD, 0000,193C,0180,0800,0000,106C :3563 T115P7: D1-0? : BRANCH IF TIME TO USE FF ADR
U 106C, 0000,003C,0180,0800,0000,11BF :3564 =1100 J/T115L7 : USE 00 ADDRESS
U 106D, 0000,003C,0180,0A10,0000,13D9 :3565 LAB_R[2],J/T115L8 : USE FF ADR
U 106E, 0000,003C,0180,0A10,0000,13D9 :3566 LAB_R[2],J/T115L8 : USE FF ADR
U 106F, 0000,003C,0180,0800,0000,11BF :3567 J/T115L7 : USE 00 ADR
:3568
:3569
:3570
:3571 :///////////////////////////////////////////////////
:3572 :+
:3573 : THIS SUBTEST CHECKS IBA<1:0> VALUES OF 10 WITH A DATA PATTERN OF
:3574 : ---FFFF0000---
:3575 :-
:3576
:3577 =0
U 11C6, 0000,003D,0180,0800,0000,130D :3578 T115S4: SUBTEST
U 11C7, 0000,003C,0180,0800,0000,11C8 :3579 NOP
U 11C8, 0818,0039,0580,0800,0000,11F9 :3580 =0 D K[.1],CALL,J/DC1
U 11C9, 0000,003C,0180,0800,0000,11CA :3581 NOP
U 11CA, 0000,003D,0180,0800,0000,1302 :3582 =0 CALL,J/DCA
U 11CB, 0001,003C,0180,0A88,0000,11CC :3583 R[1] D
U 11CC, 0000,003D,0180,0800,0000,11F3 :3584 =0 ERLOOP
U 11CD, 0018,0038,1180,09E0,0000,11CE :3585 T115L12: RC[0C] K[.4] : INIT THE BYTE COUNTER
U 11CE, 2000,003D,0180,0A08,4200,1313 :3586 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 11CF, 0000,003C,0180,0A10,0000,13DE :3587 T115L10: LAB_R[2] : GET BYTE 0=FF ADDRESS
U 13DE, 0800,003C,0180,09F0,0000,11D0 :3588 T115L11: RC[0E] LA,D LA : SAVE IN RC[E] AND PUT IN D REG
U 11D0, 0000,003D,0180,0800,0000,1312 :3589 =0 CALL,J7DISPAT : CHECK A BYTE
U 11D1, 001D,A000,0180,0800,0010,13DF :3590 ALU_Q-D,CLK.UBCC,BYTE : ADR OK?
U 13DF, 0000,013C,0180,0800,0000,11D2 :3591 Z? : BRANCH IF YES
U 11D2, 0001,A03D,0180,09E8,0000,11F4 :3592 =0 ERROR1,RC[0D]_Q,BYTE : BYTE ROTATOR FAILED
:3593
:3594
:3595 :+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST.

```

```

:3596 :-
:3597
U 11D3, C810,0038,0180,0960,0000,13E0 :3598 SYNC35: D RC[OC],IBC/CLR.0 : GET THE BYTE COUNTER
U 13E0, 0819,8000,0580,09E0,0010,13E1 :3599 RC[OC],D-K[.1],D_ALU,CLK.UBCC,BYTE : INCREMENT COUNT AND CHECK
U 13E1, 0000,013C,0180,0800,0000,11D4 :3600 Z? : BRANCH IF BYTE COUNT DONE
U 11D4, 0000,003C,0180,0800,0000,13E2 :3601 =0 J/T115P9 : GO COMPLIMENT EXP ADR AND CONT
U 11D5, 0000,003C,0180,0800,0000,13E3 :3602 J/T115S5 : GO CHECK COMPLIMENT PATTERN
U 13E2, 0000,193C,0180,0800,0000,107C :3603 T115P9: D1-0? : BRANCH IF TIME TO USE 00 ADR
U 107C, 0000,003C,0180,0800,0000,11CF :3604 =1100 J/T115L10 : USE 00 ADDRESS
U 107D, 0000,003C,0180,0A18,0000,13DE :3605 LAB_R[3],J/T115L11 : USE 00 ADR
U 107E, 0000,003C,0180,0A18,0000,13DE :3606 LAB_R[3],J/T115L11 : USE 00 ADR
U 107F, 0000,003C,0180,0800,0000,11CF :3607 J/T115L10 : USE FF ADR
U 13E3, 0000,003C,0180,0800,0000,11D6 :3608 T115S5: NOP
:3609
:3610 : THE FOLLOWING IS THE IB DATA USED IN THE ABOVE TEST:
:3611 :X F0
:3612 : SUBTEST 2 -- IBA LOOP COUNT = 1
:3613 :$ FF00,FF00,FF00,FF00
:3614 : SUBTEST 1 -- IBA LOOP COUNT = 3, AND SUBTEST 2 IBA LOOP COUNT = 2
:3615 :$ FF00,FF00,FF00,FF00
:3616 : SUBTEST 1 -- IBA LOOP COUNT = 2, AND SUBTEST 2 IBA LOOP COUNT = 3
:3617 :$ 00FF,00FF,00FF,00FF
:3618 : SUBTEST 1 -- IBA LOOP COUNT = 1
:3619 :$ 00FF,00FF,00FF,00FF
:3620 : SUBTEST 3
:3621 :$ FFFF,0000,FFFF,0000
:3622 : SUBTEST 4
:3623 :$ 0000,FFFF,0000,FFFF
:3624
:3625
:3626 =0
U 11D6, 0000,003D,0180,0800,0000,11DF :3627 T116: NEWTST
U 11D7, 0000,003C,0180,0800,0000,11D8 :3628 NOP
:3629 =0
U 11D8, 0000,003D,0180,0800,0000,11DF :3630 T117: NEWTST
U 11D9, 0000,003C,0180,0800,0000,13E4 :3631 NOP
U 13E4, 0000,003D,0180,0800,0000,11DF :3632 ENDTST: NEWTST

```

:Location	0/B	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - 0FFF Unused								
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2333=	2334=	2335=	2336=	2337=	2338=	3464=	3465=
U 1010	2346=	2347=	2349=	2350=	2352=	2353=	2388=	2389=
U 1018	2390=	2391=	2392=	2393=	2402=	2403=	3476=	3477=
U 1020	2404=	2405=	2406=	2407=	2408=	2409=	2411=	2412=
U 1028	2419=	2426=	2427=	2428=	2429=	2430=	3512=	3513=
U 1030	2431=	2432=	2433=	2434=	2436=	2437=	2496=	2497=
U 1038	2498=	2499=	2507=	2508=	2511=	2512=	3524=	3525=
U 1040	2513=	2514=	2516=	2517=	2520=	2521=	2528=	2529=
U 1048	2531=	2532=	2533=	2534=	2536=	2537=	1920:	1846
U 1050	2539=	2540=	2547=	2548=	2550=	2551=	2552=	2553=
U 1058	2555=	2556=	1924:	1869	2558=	2559=	1928:	1870
U 1060	2567=	2568=	2570=	2571=	2572=	2573=	2575=	2576=
U 1068	2578=	2585=	2586=	2587=	3564=	3565=	3566=	3567=
U 1070	2588=	2589=	2590=	2591=	2593=	2594=	2596=	2603=
U 1078	2604=	2605=	2606=	2607=	3604=	3605=	3606=	3607=
U 1080	2608=	2609=	2611=	2612=	2614=	2621=	2622=	2623=
U 1088	2624=	2625=	2626=	2627=	2629=	2630=	2632=	2633=
U 1090	2711=	2712=	2721=	2722=	2725=	2726=	2727=	2728=
U 1098	2729=	2730=	2732=	2739=	2740=	2741=	2748=	2749=
U 10A0	2750=	2751=	2752=	2753=	2755=	2762=	2763=	2764=
U 10A8	2766=	2767=	2768=	2769=	2770=	2771=	2773=	2780=
U 10B0	2781=	2782=	2783=	2784=	2785=	2786=	2787=	2788=
U 10B8	2790=	2797=	2798=	2799=	2806=	2807=	2808=	2809=
U 10C0	2810=	2811=	2813=	2814=	2821=	2822=	2824=	2825=
U 10C8	2826=	2827=	2828=	2829=	2831=	2838=	2839=	2840=
U 10D0	2841=	2842=	2843=	2844=	2846=	2847=	2849=	2850=
U 10D8	2857=	2858=	2860=	2861=	2862=	2863=	2864=	2865=
U 10E0	2867=	2874=	2875=	2876=	2877=	2878=	2879=	2880=
U 10E8	2881=	2882=	2884=	2885=	2977=	2978=	2987=	2988=
U 10F0	2989=	2990=	2994=	2995=	3000=	3001=	3003=	3004=
U 10F8	3009=	3016=	3017=	3018=	3020=	3021=	3026=	3027=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1871	3031=	3032=	1840:	1841:	1842:	1843:
U 1110	3034=	3035=	3040=	3047=	3048=	3049=	3051=	3052=
U 1118	3057=	3058=	3061=	3062=	3064=	3065=	3070=	3077=
U 1120	3078=	3079=	3081=	3082=	3087=	3088=	3092=	3093=
U 1128	3095=	3096=	3101=	3108=	3109=	3110=	3112=	3113=
U 1130	3118=	3119=	3122=	3123=	3125=	3126=	3131=	3132=
U 1138	3140=	3141=	3143=	3144=	3149=	3150=	3153=	3154=
U 1140	3156=	3157=	3163=	3170=	3171=	3172=	3174=	3175=
U 1148	3179=	3180=	3184=	3185=	3187=	3188=	3193=	3200=
U 1150	3201=	3202=	3204=	3205=	1872	2198:	3209=	3210=
U 1158	3214=	3215=	3217=	3218=	3223=	3230=	3231=	3232=
U 1160	3234=	3235=	3239=	3240=	3244=	3245=	3247=	3248=
U 1168	3253=	3260=	3261=	3262=	3264=	3265=	3269=	3270=
U 1170	3274=	3275=	3277=	3278=	3283=	3291=	3292=	3293=
U 1178	3295=	3296=	3300=	3301=	3305=	3306=	3308=	3309=
U 1180	3314=	3322=	3323=	3324=	3326=	3327=	3331=	3332=
U 1188	3336=	3337=	3339=	3340=	3345=	3346=	3426=	3427=
U 1190	3428=	3429=	3430=	3431=	3432=	3433=	3442=	3443=
U 1198	3444=	3445=	3446=	3447=	3449=	3450=	3452=	3458=

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3461=	3462=	3472=	3473=	3488=	3489=	3490=	3491=
U 11A8	3492=	3493=	3494=	3495=	3497=	3498=	3500=	3506=
U 11B0	3509=	3510=	3520=	3521=	3536=	3537=	3538=	3539=
U 11B8	3540=	3541=	3542=	3543=	3544=	3545=	3546=	3547=
U 11C0	3549=	3550=	3552=	3558=	3561=	3562=	3578=	3579=
U 11C8	3580=	3581=	3582=	3583=	3584=	3585=	3586=	3587=
U 11D0	3589=	3590=	3592=	3598=	3601=	3602=	3627=	3628=
U 11D8	3630=	3631=	1873	1874	1875	1882	1883	1897
U 11E0	1898	1899	1900	1901	1902	1903	1904	1905
U 11E8	1906	1907	1908	1909	1910	1911	1912	1913
U 11F0	1914	1915	1916	1917	1918	1919	1922	1923
U 11F8	1966	1967	1968	1969	1970	1971	1972	1973
U 1200	2027:	2028:	2029:	2030:	2031:	2032:	2033:	2034:
U 1208	2035:	2036:	2037:	2038:	2039:	2040:	2041:	2042:
U 1210	2043:	2044:	2045:	2046:	2047:	2048:	2049:	2050:
U 1218	2051:	2052:	2053:	2054:	2055:	2056:	2057:	2058:
U 1220	2059:	2060:	2061:	2062:	2063:	2064:	2065:	2066:
U 1228	2067:	2068:	2069:	2070:	2071:	2072:	2073:	2074:
U 1230	2075:	2076:	2077:	2078:	2079:	2080:	2081:	2082:
U 1238	2083:	2084:	2085:	2086:	2087:	2088:	2089:	2090:
U 1240	2091:	2092:	2093:	2094:	2095:	2096:	2097:	2098:
U 1248	2099:	2100:	2101:	2102:	2103:	2104:	2105:	2106:
U 1250	2107:	2108:	2109:	2110:	2111:	2112:	2113:	2114:
U 1258	2115:	2116:	2117:	2118:	2119:	2120:	2121:	2122:
U 1260	2123:	2124:	2125:	2126:	2127:	2128:	2129:	2130:
U 1268	2131:	2132:	2133:	2134:	2135:	2136:	2137:	2138:
U 1270	2139:	2140:	2141:	2142:	2143:	2144:	2145:	2146:
U 1278	2147:	2148:	2149:	2150:	2151:	2152:	2153:	2154:
U 1280	2155:	2156:	2157:	2158:	2159:	2160:	2161:	2162:
U 1288	2163:	2164:	2165:	2166:	2167:	2168:	2169:	2170:
U 1290	2171:	2172:	2173:	2174:	2175:	2176:	2177:	2178:
U 1298	2179:	2180:	2181:	2182:	2183:	2184:	2185:	2186:
U 12A0	2187:	2188:	2189:	2190:	2191:	2192:	2193:	2194:
U 12A8	2195:	2196:	2197:	2200:	2201:	2202:	2203:	2204:
U 12B0	2205:	2206:	2207:	2208:	2209:	2210:	2211:	2212:
U 12B8	2213:	2214:	2215:	2216:	2217:	2218:	2219:	2220:
U 12C0	2221:	2222:	2223:	2224:	2225:	2226:	2227:	2228:
U 12C8	2229:	2230:	2231:	2232:	2233:	2234:	2235:	2236:
U 12D0	2237:	2238:	2239:	2240:	2241:	2242:	2243:	2244:
U 12D8	2245:	2246:	2247:	2248:	2249:	2250:	2251:	2252:
U 12E0	2253:	2254:	2255:	2256:	2257:	2258:	2259:	2260:
U 12E8	2261:	2262:	2263:	2264:	2265:	2266:	2267:	2268:
U 12F0	2269:	2270:	2271:	2272:	2273:	2274:	2275:	2276:
U 12F8	2277:	2278:	2279:	2280:	2281:	2282:	2283:	2284:
U 1300	1974	1975	1976	1977	1978	1979	1980	1981
U 1308	1983	1984	1985	1986	1988	1998	1999	2007
U 1310	2008	2009	2022	2297	2298	2299	2300	2301
U 1318	2302	2303	2348	2351	2394	2410	2413	2414
U 1320	2415	2416	2417	2418	2435	2509	2510	2518
U 1328	2519	2538	2557	2577	2595	2613	2631	2713
U 1330	2723	2724	2731	2742	2743	2745	2746	2747
U 1338	2754	2772	2789	2800	2801	2803	2804	2805
U 1340	2812	2830	2845	2848	2866	2883	2979	2991

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ESKAH33.MCR

Line Number Index

MICRO2

1M(01)

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L 16

SEQ 0820

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Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2992	2993	2996	2997	2998	3002	3005	3006
U 1350	3007	3008	3022	3023	3024	3025	3028	3029
U 1358	3033	3036	3037	3038	3039	3053	3054	3055
U 1360	3056	3059	3063	3066	3067	3068	3069	3083
U 1368	3084	3085	3086	3089	3090	3094	3097	3098
U 1370	3099	3100	3114	3115	3116	3117	3120	3124
U 1378	3127	3128	3129	3130	3145	3146	3147	3148
U 1380	3151	3155	3158	3159	3160	3161	3162	3176
U 1388	3177	3178	3181	3182	3186	3189	3190	3191
U 1390	3192	3206	3207	3208	3211	3212	3216	3219
U 1398	3220	3221	3222	3236	3237	3238	3241	3242
U 13A0	3246	3249	3250	3251	3252	3266	3267	3268
U 13A8	3271	3272	3276	3279	3280	3281	3282	3297
U 13B0	3298	3299	3302	3303	3307	3310	3311	3312
U 13B8	3313	3328	3329	3330	3333	3334	3338	3341
U 13C0	3342	3343	3344	3448	3451	3459	3460	3463
U 13C8	3467	3468	3469	3470	3471	3475	3496	3499
U 13D0	3507	3508	3511	3515	3516	3517	3518	3519
U 13D8	3523	3548	3551	3559	3560	3563	3588	3591
U 13E0	3599	3600	3603	3608	3632			
U 13E8 - 13EF	Unused							
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F6	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

8 1
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ESKAH33.MCR MICRO2 1M(01) 16-DEC-82 12:04:31

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	Words not in bounds
ESKOODEF	0
ESKOO MAC	0
ESKAHMAC	0
ESKAH33	1013

Used 1013
Remaining

Total microwords used in memory U: 1013
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

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ESKAH33.MCR

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C 1

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; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH33.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

```

: 3      Control ROM Field Definitions
: 548    Register Transfer Macro Definitions
: 1413   Non-transfer Functions
: 1485   Branch Enable Macro Definitions
: 1564   MICRO DIAGNOSTIC DEFINED MACROS
: 2342   TEST 118                SHIFT MULTIPLEXOR DATA INTEGRITY
: 3192   TEST 119                VALID BIT GENERATION

```


22-ESKAH-V132
ESKAH34.MCR

Subroutines

MICROC2 1M(01)

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E 1

SEQ 0824
Page

1
1804
1805

.NOLIST
.LIST

CCCCC CCCC CCCC CCCC CCCC

:1806
:1807
:1808
:1809
:1810
:1811
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:1813
:1814
:1815
:1816
:1817
:1818
:1819
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.REGION/1000,13FF

*
FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF]. R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED. THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

U 1100. 0000.003C.19C0.0A78.0084.7001
U 1101. 0000.003C.05C0.0A78.0084.7001
U 1102. 0000.003C.09C0.0A78.0084.7001
U 1103. 0000.003C.0DC0.0A78.0084.7001
U 1104. 0000.003C.11C0.0A78.0084.7001
U 1105. 0000.003C.D5C0.0A78.0084.7001
U 1106. 0000.003C.D9C0.0A78.0084.7001
U 1107. 0000.003C.5DC0.0A78.0084.7001
U 1108. 0000.003C.01C0.0A78.0084.7001
U 110C. 0000.003C.85C0.0A78.0084.7001
U 110D. 0000.003C.89C0.0A78.0084.7001
U 110E. 0000.003C.65C0.0A78.0084.7001
U 110F. 0000.003C.61C0.0A78.0084.704F

1100: SC_K[ZERO],Q_R[OF],J/TRPH0 ; SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0 ; DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0 ; X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0 ; TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0 ; TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0 ; TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0 ; RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0 ; TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0 ; CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0 ; RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0 ; TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0 ; ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2 ; CS PARITY

U 1001. 0001.2024.0180.0800.0010.1006
U 1006. 0000.013C.0180.0800.0000.1002
U 1002. 0001.2036.0180.0AF8.0000.0000

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN

*
THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED. IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
TRAP CODE--INDICATES WHICH TRAP OCCURRED
FAULT STATUS REGISTER
SBI ERROR REGISTER
TIMEOUT ADDRESS REGISTER
MAINTENANCE REGISTER

[illegible]

```

U 1334, 0003,003C,0180,09E8,0000,105E :1916
U 1335, 0818,0038,0980,0800,0000,105E :1917
U 1336, 0810,0038,0180,0978,0000,1337 :1918
U 1337, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 1338, 0810,0038,0180,0978,0000,1339 :1922
U 1339, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
U 105E, 0000,003C,1D80,3C00,0000,105E :1927
:1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0C00,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,133A :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 133A, 0018,0038,1980,0800,0000,134A :1966
U 133B, 0018,0038,1980,0800,0000,134B :1967
U 133C, 0018,0038,1980,0800,0000,134C :1968
U 133D, 0018,0038,1980,0800,0000,134D :1969
U 133E, 0018,0038,0980,0800,0000,134A :1970

```

```

RC[OD] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[OF]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[OF]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
: -

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

```

```

: +
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.

```

```

: FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
: THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

```

```

: :
: : =0 D 0,CALL,J/DC5
: : NOP
: : =0 CALL,J/DC5
: :
: -

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```



```

U 133F, 0018,0038,0980,0800,0000,134B :1971
U 1340, 0018,0038,0980,0800,0000,134C :1972
U 1341, 0018,0038,0980,0800,0000,134D :1973
U 1342, 0018,0038,0580,0800,0000,134A :1974
U 1343, 0018,0038,0580,0800,0000,134B :1975
U 1344, 0018,0038,0580,0800,0000,134C :1976
U 1345, 0018,0038,0580,0800,0000,134D :1977
U 1346, 0018,0038,C180,0800,0000,134A :1978
U 1347, 0018,0038,C180,0800,0000,134B :1979
U 1348, 0018,0038,C180,0800,0000,134C :1980
U 1349, 0018,0038,C180,0800,0000,134D :1981
:1982
U 134A, 0118,0038,1B80,0800,0000,134E :1983
U 134B, 0118,0038,0B80,0800,0000,134E :1984
U 134C, 0118,0038,0780,0800,0000,134E :1985
U 134D, 0118,0038,C380,0800,0000,134E :1986
:1987
U 134E, 0100,003E,0380,0800,0000,0001 :1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
U 134F, 0810,0038,4D80,0978,0000,1350 :1998
U 1350, 0019,4016,4D80,09F8,0000,0001 :1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
U 1351, 0010,0038,01C0,0978,0000,1352 :2007
U 1352, 0019,2034,4DC0,0800,0000,1353 :2008
U 1353, 0019,2032,1D80,09F8,0000,0001 :2009
U 1155, 0019,2000,05C0,0800,0000,12AB :2010
:2011
:2012
:2013
:2014
:2015
:2016
:2017
U 1354, 0018,0000,6580,0A88,0000,1355 :2018
U 1355, 0F00,003C,0180,0A00,0200,1356 :2019
:2020
U 1356, 0000,803C,0180,A800,0000,1357 :2021
U 1357, 0018,0038,0180,0800,0200,1358 :2022
U 1358, 0000,003C,0180,A800,0000,1359 :2023
U 1359, 0018,003A,8580,0800,0200,0001 :2024
:2025

```

```

DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_O(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX

SX: D,D.LEFT2,SI/7,RETURN1 ; EXIT

```

```

: *
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
: -

```

```

SUBTST: D RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

```

```

: *
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
: -

```

```

SETRCF: Q_RC[0F]
Q-Q.AND,K[.FF00]
RC[0F],Q.OR,SC,RETURN1
1155: Q-Q-K[.1],J/12AB

```

```

: *
: THE FOLLOWING TWO SUBROUTINES ARE USED BY THE 'SHIFT MUX DATA INTEGRITY
: TEST' TO SETUP A ZERO BYTE IN A FIELD OF ALL ONE'S BYTES, AND AN ALL
: ONE'S BYTE IN A FIELD OF ZERO'S BYTES.
: -

```

```

SETUP00:
RC[1],LA-K[.10] ; DECREMENT IB ADDRESS
VA_R[0],D_0 ; LOAD ADDRESS OF BYTE TO WRITE
; WITH A ZERO
; WRITE IT
; RESTORE THE ONE'S BYTE IN THE FIELD
; OF ALL ZERO BYTES
; ...

```

U 135A, 0018,0014,0180,0A88,0000,135B
U 135B, 0000,003C,0180,0A00,0000,135C
U 135C, 0018,0014,0180,0800,0200,135D
U 135D, 081B,0000,0580,0800,0000,135E
U 135E, 0000,803C,0180,A800,0000,135F
U 135F, 0018,0038,1980,0800,0200,1360
U 1360, 0000,003C,0180,A800,0000,1361
U 1361, 0018,0038,1180,0800,0200,1362
U 1362, 0000,003E,0180,AA20,0000,0001

SETUPFF:

```
R[1] LA+K[.8]      ; INCREMENT IB ADDRESS TO FIELD OF ALL ZEROS
LAB R[0]
VA [A+K[.8]        ; LOAD BYTE ADDRESS TO WRITE ALL ONES
D 0-K[.1]          ; GET ALL ONES DATA
CACHE.P D[BYTE]    ; WRITE THE BYTE
VA K[ZERO]         ; LOAD ADDRESS TO RESTORE FIELD OF ALL ONES
CACHE.P D[LONG]
VA K[.4]
CACHE.P_D[LONG],LAB_R[4],RETURN1
```

```
:+
: THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
: THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
: AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
: THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
: THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
: THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
:-
```

SYNCOO:

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL

1200:

DISPATTBL:

U 1200, 0019,2000,05C0,0800,0000,1201
U 1201, 0019,2000,05C0,0800,0000,1202
U 1202, 0019,2000,05C0,0800,0000,1203
U 1203, 0019,2000,05C0,0800,0000,1204
U 1204, 0019,2000,05C0,0800,0000,1205
U 1205, 0019,2000,05C0,0800,0000,1206
U 1206, 0019,2000,05C0,0800,0000,1207
U 1207, 0019,2000,05C0,0800,0000,1208
U 1208, 0019,2000,05C0,0800,0000,1209
U 1209, 0019,2000,05C0,0800,0000,120A
U 120A, 0019,2000,05C0,0800,0000,120B
U 120B, 0019,2000,05C0,0800,0000,120C
U 120C, 0019,2000,05C0,0800,0000,120D
U 120D, 0019,2000,05C0,0800,0000,120E
U 120E, 0019,2000,05C0,0800,0000,120F
U 120F, 0019,2000,05C0,0800,0000,1210
U 1210, 0019,2000,05C0,0800,0000,1211
U 1211, 0019,2000,05C0,0800,0000,1212
U 1212, 0019,2000,05C0,0800,0000,1213
U 1213, 0019,2000,05C0,0800,0000,1214
U 1214, 0019,2000,05C0,0800,0000,1215
U 1215, 0019,2000,05C0,0800,0000,1216
U 1216, 0019,2000,05C0,0800,0000,1217
U 1217, 0019,2000,05C0,0800,0000,1218
U 1218, 0019,2000,05C0,0800,0000,1219
U 1219, 0019,2000,05C0,0800,0000,121A
U 121A, 0019,2000,05C0,0800,0000,121B
U 121B, 0019,2000,05C0,0800,0000,121C

```
1200:  Q-Q-K[.1]
1201:  Q-Q-K[.1]
1202:  Q-Q-K[.1]
1203:  Q-Q-K[.1]
1204:  Q-Q-K[.1]
1205:  Q-Q-K[.1]
1206:  Q-Q-K[.1]
1207:  Q-Q-K[.1]
1208:  Q-Q-K[.1]
1209:  Q-Q-K[.1]
120A:  Q-Q-K[.1]
120B:  Q-Q-K[.1]
120C:  Q-Q-K[.1]
120D:  Q-Q-K[.1]
120E:  Q-Q-K[.1]
120F:  Q-Q-K[.1]
1210:  Q-Q-K[.1]
1211:  Q-Q-K[.1]
1212:  Q-Q-K[.1]
1213:  Q-Q-K[.1]
1214:  Q-Q-K[.1]
1215:  Q-Q-K[.1]
1216:  Q-Q-K[.1]
1217:  Q-Q-K[.1]
1218:  Q-Q-K[.1]
1219:  Q-Q-K[.1]
121A:  Q-Q-K[.1]
121B:  Q-Q-K[.1]
```

U 121C.	0019.2000.05C0.0800.0000.121D	:2081	121C:	Q-Q-K[.1]
U 121D.	0019.2000.05C0.0800.0000.121E	:2082	121D:	Q-Q-K[.1]
U 121E.	0019.2000.05C0.0800.0000.121F	:2083	121E:	Q-Q-K[.1]
U 121F.	0019.2000.05C0.0800.0000.1220	:2084	121F:	Q-Q-K[.1]
U 1220.	0019.2000.05C0.0800.0000.1221	:2085	1220:	Q-Q-K[.1]
U 1221.	0019.2000.05C0.0800.0000.1222	:2086	1221:	Q-Q-K[.1]
U 1222.	0019.2000.05C0.0800.0000.1223	:2087	1222:	Q-Q-K[.1]
U 1223.	0019.2000.05C0.0800.0000.1224	:2088	1223:	Q-Q-K[.1]
U 1224.	0019.2000.05C0.0800.0000.1225	:2089	1224:	Q-Q-K[.1]
U 1225.	0019.2000.05C0.0800.0000.1226	:2090	1225:	Q-Q-K[.1]
U 1226.	0019.2000.05C0.0800.0000.1227	:2091	1226:	Q-Q-K[.1]
U 1227.	0019.2000.05C0.0800.0000.1228	:2092	1227:	Q-Q-K[.1]
U 1228.	0019.2000.05C0.0800.0000.1229	:2093	1228:	Q-Q-K[.1]
U 1229.	0019.2000.05C0.0800.0000.122A	:2094	1229:	Q-Q-K[.1]
U 122A.	0019.2000.05C0.0800.0000.122B	:2095	122A:	Q-Q-K[.1]
U 122B.	0019.2000.05C0.0800.0000.122C	:2096	122B:	Q-Q-K[.1]
U 122C.	0019.2000.05C0.0800.0000.122D	:2097	122C:	Q-Q-K[.1]
U 122D.	0019.2000.05C0.0800.0000.122E	:2098	122D:	Q-Q-K[.1]
U 122E.	0019.2000.05C0.0800.0000.122F	:2099	122E:	Q-Q-K[.1]
U 122F.	0019.2000.05C0.0800.0000.1230	:2100	122F:	Q-Q-K[.1]
U 1230.	0019.2000.05C0.0800.0000.1231	:2101	1230:	Q-Q-K[.1]
U 1231.	0019.2000.05C0.0800.0000.1232	:2102	1231:	Q-Q-K[.1]
U 1232.	0019.2000.05C0.0800.0000.1233	:2103	1232:	Q-Q-K[.1]
U 1233.	0019.2000.05C0.0800.0000.1234	:2104	1233:	Q-Q-K[.1]
U 1234.	0019.2000.05C0.0800.0000.1235	:2105	1234:	Q-Q-K[.1]
U 1235.	0019.2000.05C0.0800.0000.1236	:2106	1235:	Q-Q-K[.1]
U 1236.	0019.2000.05C0.0800.0000.1237	:2107	1236:	Q-Q-K[.1]
U 1237.	0019.2000.05C0.0800.0000.1238	:2108	1237:	Q-Q-K[.1]
U 1238.	0019.2000.05C0.0800.0000.1239	:2109	1238:	Q-Q-K[.1]
U 1239.	0019.2000.05C0.0800.0000.123A	:2110	1239:	Q-Q-K[.1]
U 123A.	0019.2000.05C0.0800.0000.123B	:2111	123A:	Q-Q-K[.1]
U 123B.	0019.2000.05C0.0800.0000.123C	:2112	123B:	Q-Q-K[.1]
U 123C.	0019.2000.05C0.0800.0000.123D	:2113	123C:	Q-Q-K[.1]
U 123D.	0019.2000.05C0.0800.0000.123E	:2114	123D:	Q-Q-K[.1]
U 123E.	0019.2000.05C0.0800.0000.123F	:2115	123E:	Q-Q-K[.1]
U 123F.	0019.2000.05C0.0800.0000.1240	:2116	123F:	Q-Q-K[.1]
U 1240.	0019.2000.05C0.0800.0000.1241	:2117	1240:	Q-Q-K[.1]
U 1241.	0019.2000.05C0.0800.0000.1242	:2118	1241:	Q-Q-K[.1]
U 1242.	0019.2000.05C0.0800.0000.1243	:2119	1242:	Q-Q-K[.1]
U 1243.	0019.2000.05C0.0800.0000.1244	:2120	1243:	Q-Q-K[.1]
U 1244.	0019.2000.05C0.0800.0000.1245	:2121	1244:	Q-Q-K[.1]
U 1245.	0019.2000.05C0.0800.0000.1246	:2122	1245:	Q-Q-K[.1]
U 1246.	0019.2000.05C0.0800.0000.1247	:2123	1246:	Q-Q-K[.1]
U 1247.	0019.2000.05C0.0800.0000.1248	:2124	1247:	Q-Q-K[.1]
U 1248.	0019.2000.05C0.0800.0000.1249	:2125	1248:	Q-Q-K[.1]
U 1249.	0019.2000.05C0.0800.0000.124A	:2126	1249:	Q-Q-K[.1]
U 124A.	0019.2000.05C0.0800.0000.124B	:2127	124A:	Q-Q-K[.1]
U 124B.	0019.2000.05C0.0800.0000.124C	:2128	124B:	Q-Q-K[.1]
U 124C.	0019.2000.05C0.0800.0000.124D	:2129	124C:	Q-Q-K[.1]
U 124D.	0019.2000.05C0.0800.0000.124E	:2130	124D:	Q-Q-K[.1]
U 124E.	0019.2000.05C0.0800.0000.124F	:2131	124E:	Q-Q-K[.1]
U 124F.	0019.2000.05C0.0800.0000.1250	:2132	124F:	Q-Q-K[.1]
U 1250.	0019.2000.05C0.0800.0000.1251	:2133	1250:	Q-Q-K[.1]
U 1251.	0019.2000.05C0.0800.0000.1252	:2134	1251:	Q-Q-K[.1]
U 1252.	0019.2000.05C0.0800.0000.1253	:2135	1252:	Q-Q-K[.1]

U 1253.	0019,2000,05C0,0800,0000,1254	:2136	1253:	Q-Q-K[.1]
U 1254.	0019,2000,05C0,0800,0000,1255	:2137	1254:	Q-Q-K[.1]
U 1255.	0019,2000,05C0,0800,0000,1256	:2138	1255:	Q-Q-K[.1]
U 1256.	0019,2000,05C0,0800,0000,1257	:2139	1256:	Q-Q-K[.1]
U 1257.	0019,2000,05C0,0800,0000,1258	:2140	1257:	Q-Q-K[.1]
U 1258.	0019,2000,05C0,0800,0000,1259	:2141	1258:	Q-Q-K[.1]
U 1259.	0019,2000,05C0,0800,0000,125A	:2142	1259:	Q-Q-K[.1]
U 125A.	0019,2000,05C0,0800,0000,125B	:2143	125A:	Q-Q-K[.1]
U 125B.	0019,2000,05C0,0800,0000,125C	:2144	125B:	Q-Q-K[.1]
U 125C.	0019,2000,05C0,0800,0000,125D	:2145	125C:	Q-Q-K[.1]
U 125D.	0019,2000,05C0,0800,0000,125E	:2146	125D:	Q-Q-K[.1]
U 125E.	0019,2000,05C0,0800,0000,125F	:2147	125E:	Q-Q-K[.1]
U 125F.	0019,2000,05C0,0800,0000,1260	:2148	125F:	Q-Q-K[.1]
U 1260.	0019,2000,05C0,0800,0000,1261	:2149	1260:	Q-Q-K[.1]
U 1261.	0019,2000,05C0,0800,0000,1262	:2150	1261:	Q-Q-K[.1]
U 1262.	0019,2000,05C0,0800,0000,1263	:2151	1262:	Q-Q-K[.1]
U 1263.	0019,2000,05C0,0800,0000,1264	:2152	1263:	Q-Q-K[.1]
U 1264.	0019,2000,05C0,0800,0000,1265	:2153	1264:	Q-Q-K[.1]
U 1265.	0019,2000,05C0,0800,0000,1266	:2154	1265:	Q-Q-K[.1]
U 1266.	0019,2000,05C0,0800,0000,1267	:2155	1266:	Q-Q-K[.1]
U 1267.	0019,2000,05C0,0800,0000,1268	:2156	1267:	Q-Q-K[.1]
U 1268.	0019,2000,05C0,0800,0000,1269	:2157	1268:	Q-Q-K[.1]
U 1269.	0019,2000,05C0,0800,0000,126A	:2158	1269:	Q-Q-K[.1]
U 126A.	0019,2000,05C0,0800,0000,126B	:2159	126A:	Q-Q-K[.1]
U 126B.	0019,2000,05C0,0800,0000,126C	:2160	126B:	Q-Q-K[.1]
U 126C.	0019,2000,05C0,0800,0000,126D	:2161	126C:	Q-Q-K[.1]
U 126D.	0019,2000,05C0,0800,0000,126E	:2162	126D:	Q-Q-K[.1]
U 126E.	0019,2000,05C0,0800,0000,126F	:2163	126E:	Q-Q-K[.1]
U 126F.	0019,2000,05C0,0800,0000,1270	:2164	126F:	Q-Q-K[.1]
U 1270.	0019,2000,05C0,0800,0000,1271	:2165	1270:	Q-Q-K[.1]
U 1271.	0019,2000,05C0,0800,0000,1272	:2166	1271:	Q-Q-K[.1]
U 1272.	0019,2000,05C0,0800,0000,1273	:2167	1272:	Q-Q-K[.1]
U 1273.	0019,2000,05C0,0800,0000,1274	:2168	1273:	Q-Q-K[.1]
U 1274.	0019,2000,05C0,0800,0000,1275	:2169	1274:	Q-Q-K[.1]
U 1275.	0019,2000,05C0,0800,0000,1276	:2170	1275:	Q-Q-K[.1]
U 1276.	0019,2000,05C0,0800,0000,1277	:2171	1276:	Q-Q-K[.1]
U 1277.	0019,2000,05C0,0800,0000,1278	:2172	1277:	Q-Q-K[.1]
U 1278.	0019,2000,05C0,0800,0000,1279	:2173	1278:	Q-Q-K[.1]
U 1279.	0019,2000,05C0,0800,0000,127A	:2174	1279:	Q-Q-K[.1]
U 127A.	0019,2000,05C0,0800,0000,127B	:2175	127A:	Q-Q-K[.1]
U 127B.	0019,2000,05C0,0800,0000,127C	:2176	127B:	Q-Q-K[.1]
U 127C.	0019,2000,05C0,0800,0000,127D	:2177	127C:	Q-Q-K[.1]
U 127D.	0019,2000,05C0,0800,0000,127E	:2178	127D:	Q-Q-K[.1]
U 127E.	0019,2000,05C0,0800,0000,127F	:2179	127E:	Q-Q-K[.1]
U 127F.	0019,2000,05C0,0800,0000,1280	:2180	127F:	Q-Q-K[.1]
U 1280.	0019,2000,05C0,0800,0000,1281	:2181	1280:	Q-Q-K[.1]
U 1281.	0019,2000,05C0,0800,0000,1282	:2182	1281:	Q-Q-K[.1]
U 1282.	0019,2000,05C0,0800,0000,1283	:2183	1282:	Q-Q-K[.1]
U 1283.	0019,2000,05C0,0800,0000,1284	:2184	1283:	Q-Q-K[.1]
U 1284.	0019,2000,05C0,0800,0000,1285	:2185	1284:	Q-Q-K[.1]
U 1285.	0019,2000,05C0,0800,0000,1286	:2186	1285:	Q-Q-K[.1]
U 1286.	0019,2000,05C0,0800,0000,1287	:2187	1286:	Q-Q-K[.1]
U 1287.	0019,2000,05C0,0800,0000,1288	:2188	1287:	Q-Q-K[.1]
U 1288.	0019,2000,05C0,0800,0000,1289	:2189	1288:	Q-Q-K[.1]
U 1289.	0019,2000,05C0,0800,0000,128A	:2190	1289:	Q-Q-K[.1]

U 128A.	0019.2000.05C0.0800.0000.128B	:2191	128A:	Q-Q-K[.1]
U 128B.	0019.2000.05C0.0800.0000.128C	:2192	128B:	Q-Q-K[.1]
U 128C.	0019.2000.05C0.0800.0000.128D	:2193	128C:	Q-Q-K[.1]
U 128D.	0019.2000.05C0.0800.0000.128E	:2194	128D:	Q-Q-K[.1]
U 128E.	0019.2000.05C0.0800.0000.128F	:2195	128E:	Q-Q-K[.1]
U 128F.	0019.2000.05C0.0800.0000.1290	:2196	128F:	Q-Q-K[.1]
U 1290.	0019.2000.05C0.0800.0000.1291	:2197	1290:	Q-Q-K[.1]
U 1291.	0019.2000.05C0.0800.0000.1292	:2198	1291:	Q-Q-K[.1]
U 1292.	0019.2000.05C0.0800.0000.1293	:2199	1292:	Q-Q-K[.1]
U 1293.	0019.2000.05C0.0800.0000.1294	:2200	1293:	Q-Q-K[.1]
U 1294.	0019.2000.05C0.0800.0000.1295	:2201	1294:	Q-Q-K[.1]
U 1295.	0019.2000.05C0.0800.0000.1296	:2202	1295:	Q-Q-K[.1]
U 1296.	0019.2000.05C0.0800.0000.1297	:2203	1296:	Q-Q-K[.1]
U 1297.	0019.2000.05C0.0800.0000.1298	:2204	1297:	Q-Q-K[.1]
U 1298.	0019.2000.05C0.0800.0000.1299	:2205	1298:	Q-Q-K[.1]
U 1299.	0019.2000.05C0.0800.0000.129A	:2206	1299:	Q-Q-K[.1]
U 129A.	0019.2000.05C0.0800.0000.129B	:2207	129A:	Q-Q-K[.1]
U 129B.	0019.2000.05C0.0800.0000.129C	:2208	129B:	Q-Q-K[.1]
U 129C.	0019.2000.05C0.0800.0000.129D	:2209	129C:	Q-Q-K[.1]
U 129D.	0019.2000.05C0.0800.0000.129E	:2210	129D:	Q-Q-K[.1]
U 129E.	0019.2000.05C0.0800.0000.129F	:2211	129E:	Q-Q-K[.1]
U 129F.	0019.2000.05C0.0800.0000.12A0	:2212	129F:	Q-Q-K[.1]
U 12A0.	0019.2000.05C0.0800.0000.12A1	:2213	12A0:	Q-Q-K[.1]
U 12A1.	0019.2000.05C0.0800.0000.12A2	:2214	12A1:	Q-Q-K[.1]
U 12A2.	0019.2000.05C0.0800.0000.12A3	:2215	12A2:	Q-Q-K[.1]
U 12A3.	0019.2000.05C0.0800.0000.12A4	:2216	12A3:	Q-Q-K[.1]
U 12A4.	0019.2000.05C0.0800.0000.12A5	:2217	12A4:	Q-Q-K[.1]
U 12A5.	0019.2000.05C0.0800.0000.12A6	:2218	12A5:	Q-Q-K[.1]
U 12A6.	0019.2000.05C0.0800.0000.12A7	:2219	12A6:	Q-Q-K[.1]
U 12A7.	0019.2000.05C0.0800.0000.12A8	:2220	12A7:	Q-Q-K[.1]
U 12A8.	0019.2000.05C0.0800.0000.12A9	:2221	12A8:	Q-Q-K[.1]
U 12A9.	0019.2000.05C0.0800.0000.12AA	:2222	12A9:	Q-Q-K[.1]
U 12AA.	0019.2000.05C0.0800.0000.12AB	:2223	12AA:	Q-Q-K[.1]
U 12AB.	0019.2000.05C0.0800.0000.12AC	:2224	12AB:	Q-Q-K[.1]
U 12AC.	0019.2000.05C0.0800.0000.12AD	:2225	12AC:	Q-Q-K[.1]
U 12AD.	0019.2000.05C0.0800.0000.12AE	:2226	12AD:	Q-Q-K[.1]
U 12AE.	0019.2000.05C0.0800.0000.12AF	:2227	12AE:	Q-Q-K[.1]
U 12AF.	0019.2000.05C0.0800.0000.12B0	:2228	12AF:	Q-Q-K[.1]
U 12B0.	0019.2000.05C0.0800.0000.12B1	:2229	12B0:	Q-Q-K[.1]
U 12B1.	0019.2000.05C0.0800.0000.12B2	:2230	12B1:	Q-Q-K[.1]
U 12B2.	0019.2000.05C0.0800.0000.12B3	:2231	12B2:	Q-Q-K[.1]
U 12B3.	0019.2000.05C0.0800.0000.12B4	:2232	12B3:	Q-Q-K[.1]
U 12B4.	0019.2000.05C0.0800.0000.12B5	:2233	12B4:	Q-Q-K[.1]
U 12B5.	0019.2000.05C0.0800.0000.12B6	:2234	12B5:	Q-Q-K[.1]
U 12B6.	0019.2000.05C0.0800.0000.12B7	:2235	12B6:	Q-Q-K[.1]
U 12B7.	0019.2000.05C0.0800.0000.12B8	:2236	12B7:	Q-Q-K[.1]
U 12B8.	0019.2000.05C0.0800.0000.12B9	:2237	12B8:	Q-Q-K[.1]
U 12B9.	0019.2000.05C0.0800.0000.12BA	:2238	12B9:	Q-Q-K[.1]
U 12BA.	0019.2000.05C0.0800.0000.12BB	:2239	12BA:	Q-Q-K[.1]
U 12BB.	0019.2000.05C0.0800.0000.12BC	:2240	12BB:	Q-Q-K[.1]
U 12BC.	0019.2000.05C0.0800.0000.12BD	:2241	12BC:	Q-Q-K[.1]
U 12BD.	0019.2000.05C0.0800.0000.12BE	:2242	12BD:	Q-Q-K[.1]
U 12BE.	0019.2000.05C0.0800.0000.12BF	:2243	12BE:	Q-Q-K[.1]
U 12BF.	0019.2000.05C0.0800.0000.12C0	:2244	12BF:	Q-Q-K[.1]
U 12C0.	0019.2000.05C0.0800.0000.12C1	:2245	12C0:	Q-Q-K[.1]

U 12C1.	0019,2000,05C0,0800,0000,12C2	:2246	12C1:	Q-Q-K[.1]
U 12C2.	0019,2000,05C0,0800,0000,12C3	:2247	12C2:	Q-Q-K[.1]
U 12C3.	0019,2000,05C0,0800,0000,12C4	:2248	12C3:	Q-Q-K[.1]
U 12C4.	0019,2000,05C0,0800,0000,12C5	:2249	12C4:	Q-Q-K[.1]
U 12C5.	0019,2000,05C0,0800,0000,12C6	:2250	12C5:	Q-Q-K[.1]
U 12C6.	0019,2000,05C0,0800,0000,12C7	:2251	12C6:	Q-Q-K[.1]
U 12C7.	0019,2000,05C0,0800,0000,12C8	:2252	12C7:	Q-Q-K[.1]
U 12C8.	0019,2000,05C0,0800,0000,12C9	:2253	12C8:	Q-Q-K[.1]
U 12C9.	0019,2000,05C0,0800,0000,12CA	:2254	12C9:	Q-Q-K[.1]
U 12CA.	0019,2000,05C0,0800,0000,12CB	:2255	12CA:	Q-Q-K[.1]
U 12CB.	0019,2000,05C0,0800,0000,12CC	:2256	12CB:	Q-Q-K[.1]
U 12CC.	0019,2000,05C0,0800,0000,12CD	:2257	12CC:	Q-Q-K[.1]
U 12CD.	0019,2000,05C0,0800,0000,12CE	:2258	12CD:	Q-Q-K[.1]
U 12CE.	0019,2000,05C0,0800,0000,12CF	:2259	12CE:	Q-Q-K[.1]
U 12CF.	0019,2000,05C0,0800,0000,12D0	:2260	12CF:	Q-Q-K[.1]
U 12D0.	0019,2000,05C0,0800,0000,12D1	:2261	12D0:	Q-Q-K[.1]
U 12D1.	0019,2000,05C0,0800,0000,12D2	:2262	12D1:	Q-Q-K[.1]
U 12D2.	0019,2000,05C0,0800,0000,12D3	:2263	12D2:	Q-Q-K[.1]
U 12D3.	0019,2000,05C0,0800,0000,12D4	:2264	12D3:	Q-Q-K[.1]
U 12D4.	0019,2000,05C0,0800,0000,12D5	:2265	12D4:	Q-Q-K[.1]
U 12D5.	0019,2000,05C0,0800,0000,12D6	:2266	12D5:	Q-Q-K[.1]
U 12D6.	0019,2000,05C0,0800,0000,12D7	:2267	12D6:	Q-Q-K[.1]
U 12D7.	0019,2000,05C0,0800,0000,12D8	:2268	12D7:	Q-Q-K[.1]
U 12D8.	0019,2000,05C0,0800,0000,12D9	:2269	12D8:	Q-Q-K[.1]
U 12D9.	0019,2000,05C0,0800,0000,12DA	:2270	12D9:	Q-Q-K[.1]
U 12DA.	0019,2000,05C0,0800,0000,12DB	:2271	12DA:	Q-Q-K[.1]
U 12DB.	0019,2000,05C0,0800,0000,12DC	:2272	12DB:	Q-Q-K[.1]
U 12DC.	0019,2000,05C0,0800,0000,12DD	:2273	12DC:	Q-Q-K[.1]
U 12DD.	0019,2000,05C0,0800,0000,12DE	:2274	12DD:	Q-Q-K[.1]
U 12DE.	0019,2000,05C0,0800,0000,12DF	:2275	12DE:	Q-Q-K[.1]
U 12DF.	0019,2000,05C0,0800,0000,12E0	:2276	12DF:	Q-Q-K[.1]
U 12E0.	0019,2000,05C0,0800,0000,12E1	:2277	12E0:	Q-Q-K[.1]
U 12E1.	0019,2000,05C0,0800,0000,12E2	:2278	12E1:	Q-Q-K[.1]
U 12E2.	0019,2000,05C0,0800,0000,12E3	:2279	12E2:	Q-Q-K[.1]
U 12E3.	0019,2000,05C0,0800,0000,12E4	:2280	12E3:	Q-Q-K[.1]
U 12E4.	0019,2000,05C0,0800,0000,12E5	:2281	12E4:	Q-Q-K[.1]
U 12E5.	0019,2000,05C0,0800,0000,12E6	:2282	12E5:	Q-Q-K[.1]
U 12E6.	0019,2000,05C0,0800,0000,12E7	:2283	12E6:	Q-Q-K[.1]
U 12E7.	0019,2000,05C0,0800,0000,12E8	:2284	12E7:	Q-Q-K[.1]
U 12E8.	0019,2000,05C0,0800,0000,12E9	:2285	12E8:	Q-Q-K[.1]
U 12E9.	0019,2000,05C0,0800,0000,12EA	:2286	12E9:	Q-Q-K[.1]
U 12EA.	0019,2000,05C0,0800,0000,12EB	:2287	12EA:	Q-Q-K[.1]
U 12EB.	0019,2000,05C0,0800,0000,12EC	:2288	12EB:	Q-Q-K[.1]
U 12EC.	0019,2000,05C0,0800,0000,12ED	:2289	12EC:	Q-Q-K[.1]
U 12ED.	0019,2000,05C0,0800,0000,12EE	:2290	12ED:	Q-Q-K[.1]
U 12EE.	0019,2000,05C0,0800,0000,12EF	:2291	12EE:	Q-Q-K[.1]
U 12EF.	0019,2000,05C0,0800,0000,12F0	:2292	12EF:	Q-Q-K[.1]
U 12F0.	0019,2000,05C0,0800,0000,12F1	:2293	12F0:	Q-Q-K[.1]
U 12F1.	0019,2000,05C0,0800,0000,12F2	:2294	12F1:	Q-Q-K[.1]
U 12F2.	0019,2000,05C0,0800,0000,12F3	:2295	12F2:	Q-Q-K[.1]
U 12F3.	0019,2000,05C0,0800,0000,12F4	:2296	12F3:	Q-Q-K[.1]
U 12F4.	0019,2000,05C0,0800,0000,12F5	:2297	12F4:	Q-Q-K[.1]
U 12F5.	0019,2000,05C0,0800,0000,12F6	:2298	12F5:	Q-Q-K[.1]
U 12F6.	0019,2000,05C0,0800,0000,12F7	:2299	12F6:	Q-Q-K[.1]
U 12F7.	0019,2000,05C0,0800,0000,12F8	:2300	12F7:	Q-Q-K[.1]

U 12F8, 0019,2000,05C0,0800,0000,12F9 :2301
U 12F9, 0019,2000,05C0,0800,0000,12FA :2302
U 12FA, 0019,2000,05C0,0800,0000,12FB :2303
U 12FB, 0019,2000,05C0,0800,0000,12FC :2304
U 12FC, 0019,2000,05C0,0800,0000,12FD :2305
U 12FD, 0019,2000,05C0,0800,0000,12FE :2306
U 12FE, 0019,2000,05C0,0800,0000,12FF :2307
U 12FF, 0019,2002,05C0,0800,0000,0001 :2308

12F8: Q-Q-K[.1]
12F9: Q-Q-K[.1]
12FA: Q-Q-K[.1]
12FB: Q-Q-K[.1]
12FC: Q-Q-K[.1]
12FD: Q-Q-K[.1]
12FE: Q-Q-K[.1]
12FF: Q-Q-K[.1],RETURN1

:+
: THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE CACHE
: REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB IS
: COMPLETELY FULL OF DATA.
:-

U 1364, 3000,003C,0180,6000,0000,1365 :2316
U 1365, 0000,003C,0180,F800,0000,1366 :2317
U 1366, 0000,003C,0180,F800,0000,1367 :2318
U 1367, 0000,003C,0180,F800,0000,1368 :2320
U 1368, 0000,003C,0180,F800,0000,1369 :2321
U 1369, 0000,003C,0180,F800,0000,136A :2323
U 136A, 1000,003E,0180,F800,0000,0001 :2324

IBWAIT: LOAD,IB,IBC/START
SYNC02: MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
SYNC21:
WAIT2: MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
SYNC20:
WAIT1: MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ,IBC/STOP,RETURN1

:+
: THIS ROUTINE STARTS THE INSTRUCTION BUFFER, WAITS FOR ONE REFERENCE,
: AND SHUTS THE IB OFF.
:-

U 136B, 3000,003C,0180,6000,0000,1369 :2332

IBWAITONCE:
LOAD,IB,IBC/START,J/WAIT1

:+
: THIS ROUTINE STARTS THE INSTRUCTION BUFFER, WAITS FOR TWO REFERENCES,
: AND SHUTS THE IB OFF.
:-

U 136C, 3000,003C,0180,6000,0000,1367 :2341

IBTWICE:
LOAD,IB,IBC/START,J/WAIT2

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2342 .PAGE "TEST 118 SHIFT MULTIPLEXOR DATA INTEGRITY"
2343 .*****
2344 .++
2345 .TEST 118 SHIFT MULTIPLEXOR DATA INTEGRITY
2346 .
2347 .TEST DESCRIPTION
2348 .THIS TEST CHECKS THE DATA INTEGRITY OF THE BYTE SHIFTERS. THIS IS
2349 .DONE BY TAKING AN 8 BYTE MEMORY PATTERN OF ALL ONES, WRITING A
2350 .BYTE OF ALL ZEROS INTO THIS PATTERN IN THE POSITION THAT WILL GET
2351 .SHIFTED INTO THE BYTE UNDER TEST, ALLOWING THE IB TO LOAD THE
2352 .PATTERN, EXECUTING THE SHIFT, AND THEN CHECKING THE BYTE UNDER
2353 .TEST TO ENSURE THE ZEROS WERE SHIFTED INTO IT.
2354 .THE TEST IS THEN REPEATED WITH THE COMPLIMENT PATTERN.
2355 .
2356 .SUBTST 1 - BYTE 0 GETS BYTE 1
2357 .SUBTST 2 - BYTE 0 GETS BYTE 2
2358 .SUBTST 3 - BYTE 0 GETS BYTE 4
2359 .SUBTST 4 - BYTE 1 GETS BYTE 1
2360 .SUBTST 5 - BYTE 1 GETS BYTE 2
2361 .SUBTST 6 - BYTE 1 GETS BYTE 3
2362 .SUBTST 7 - BYTE 1 GETS BYTE 5
2363 .SUBTST 8 - BYTE 2 GETS BYTE 2
2364 .SUBTST 9 - BYTE 2 GETS BYTE 3
2365 .SUBTST A - BYTE 2 GETS BYTE 4
2366 .SUBTST B - BYTE 2 GETS BYTE 6
2367 .SUBTST C - BYTE 3 GETS BYTE 3
2368 .SUBTST D - BYTE 3 GETS BYTE 4
2369 .SUBTST E - BYTE 3 GETS BYTE 5
2370 .SUBTST F - BYTE 3 GETS BYTE 7
2371 .SUBTST 10- BYTE 4 GETS BYTE 4
2372 .SUBTST 11- BYTE 4 GETS BYTE 5
2373 .SUBTST 12- BYTE 4 GETS BYTE 6
2374 .SUBTST 13- BYTE 4 GETS INVALIDATED
2375 .SUBTST 41- BYTE 5 GETS BYTE 5
2376 .SUBTST 15- BYTE 5 GETS BYTE 6
2377 .SUBTST 16- BYTE 5 GETS BYTE 7
2378 .SUBTST 17- BYTE 5 GETS INVALIDATED
2379 .SUBTST 18- BYTE 6 GETS BYTE 6
2380 .SUBTST 19- BYTE 6 GETS BYTE 7
2381 .SUBTST 1A- BYTE 6 GETS INVALIDATED
2382 .
2383 .LOGIC DESCRIPTION
2384 .THIS TEST CHECKS THE DATA PATH BETWEEN THE BUFFER,
2385 .THE SHIFTER, THE INPUT MULTIPLEXOR, AND BACK TO THE BUFFER ON THE
2386 .IDP MODULE.
2387 .
2388 .ERROR DESCRIPTION
2389 .DATA: EXPECTED MICRO PC BITS <7:0>
2390 .RECEIVED MICRO PC BITS <7:0>
2391 .THE EXPECTED DATA WILL EITHER BE 8F, 83, OR 7E DEPENDING ON WHETHER
2392 .THE BYTE UNDER TEST IS ALL ZERO'S OR ALL ONE'S OR INVALID. IF A BIT IS DROPP
2393 .OR PICKED UP IN THE BYTE UNDER TEST, THE RECEIVED DATA COULD BE
2394 .ANYTHING.
2395 .
2396 .SYNC POINT DESCRIPTION

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2397 SUBTST 1 - SYNC06--BYTE 0 GETS BYTE 1
2398 SUBTST 2 - SYNC07--BYTE 0 GETS BYTE 2
2399 SUBTST 3 - SYNC08--BYTE 0 GETS BYTE 4
2400 SUBTST 4 - SYNC09--BYTE 1 GETS BYTE 1
2401 SUBTST 5 - SYNC0A--BYTE 1 GETS BYTE 2
2402 SUBTST 6 - SYNC0B--BYTE 1 GETS BYTE 3
2403 SUBTST 7 - SYNC0C--BYTE 1 GETS BYTE 5
2404 SUBTST 8 - SYNC0D--BYTE 2 GETS BYTE 2
2405 SUBTST 9 - SYNC0E--BYTE 2 GETS BYTE 3
2406 SUBTST A - SYNC0F--BYTE 2 GETS BYTE 4
2407 SUBTST B - SYNC10--BYTE 2 GETS BYTE 6
2408 SUBTST C - SYNC11--BYTE 3 GETS BYTE 3
2409 SUBTST D - SYNC12--BYTE 3 GETS BYTE 4
2410 SUBTST E - SYNC13--BYTE 3 GETS BYTE 5
2411 SUBTST F - SYNC14--BYTE 3 GETS BYTE 7
2412 SUBTST 10- SYNC15--BYTE 4 GETS BYTE 4
2413 SUBTST 11- SYNC16--BYTE 4 GETS BYTE 5
2414 SUBTST 12- SYNC17--BYTE 4 GETS BYTE 6
2415 SUBTST 13- SYNC18--BYTE 4 GETS INVALID DATED
2416 SUBTST 14- SYNC19--BYTE 5 GETS BYTE 5
2417 SUBTST 15- SYNC1A--BYTE 5 GETS BYTE 6
2418 SUBTST 16- SYNC1B--BYTE 5 GETS BYTE 7
2419 SUBTST 17- SYNC1C--BYTE 5 GETS INVALID DATED
2420 SUBTST 18- SYNC1D--BYTE 6 GETS BYTE 6
2421 SUBTST 19- SYNC1E--BYTE 6 GETS BYTE 7
2422 SUBTST 1A- SYNC1F--BYTE 6 GETS INVALID DATED
2423
2424 *****
2425 =0
U 100A. 0018.0039.0980.09F8.0000.105F 2426 T118: NEWTST[.2]
U 100B. 0018.0038.6580.0A88.0000.136D 2427 R[1]_K[.10] ; SET ADDRESS OF IB DATA (+16)
U 136D. 0018.0038.0580.0A80.0000.100C 2428 R[0]_K[.1] ; SET ADDRESS OF BYTE UNDER TEST
U 100C. 0818.0039.0180.0800.0000.133D 2429 =0 D_K[.8],CALL,J/DC3 ; GEN EXP ADR WHEN BYTE 0=FF
U 100D. 0001.003C.0180.0A90.0000.1010 2430 R[2]_D ; SAVE IN R2
U 1010. 0818.0039.0180.0800.0000.1349 2431 =0 D_K[.8],CALL,J/DCF ; GEN ADDRESS WHEN BYTE 0 = 00
U 1011. 0001.003C.0180.0A98.0082.1012 2432 R[3]_D,SC_ALU ; SAVE IN R3
2433
2434 :////////////////////
2435 :+
2436 : BYTE 0---SHIFT BY ONE
2437 :-
2438
2439 =0
U 1012. 0000.003D.0180.0800.0000.134F 2440 T118S1: SUBTEST
U 1013. 0018.0038.0980.0AA0.0000.1014 2441 R[4]_K[.2] ; SET THE LOOP CNT
U 1014. 0000.003D.6580.0A08.0000.1354 2442 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1015. 0000.003C.0180.0A18.0000.1018 2443 CACHE.P_D[LONG],LAB_R[3]
2444 =0
U 1018. 0000.003D.0180.09F0.0000.1335 2445 T118L1: ERLOOP,RC[OE]_LA ; SAVE EXPECTED ADDRESS
U 1019. 1810.0038.0180.0970.0000.101A 2446 D RC[OE],IBC/STOP ; PUT IT IN D REG
U 101A. 2000.003D.0180.0A08.4200.1364 2447 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 101B. 0000.003C.0180.0800.0000.101C 2448 NOP
2449 =0
U 101C. C000.003D.0180.0800.0000.1363 2450 SYNC06: IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 101D. 001D.A000.0180.0800.0010.136E 2451 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?

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U 136E, 0000,013C,0180,0A00,0200,1020 :2452 Z?,VA R[0] : BRANCH IF YES
U 1020, 0001,A03D,0180,09E8,0000,1336 :2453 ERROR,RC[0D]_Q,BYTE :
U 1021, 0000,003C,0180,0800,0000,1022 :2454 NOP :
U 1022, 0000,003D,0180,0A08,0000,135A :2455 =0 LAB R[1],CALL,J/SETUPFF : WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1023, 0018,0000,0580,0AA0,0010,136F :2456 R[4]_LA-K[1],CLK.UBCC : CHECK THE LOOP COUNT
U 136F, 0000,013C,0180,0800,0000,1024 :2457 Z? : BRANCH IF LOOP FINISHED
U 1024, 0000,003C,0180,0A10,0000,1018 :2458 =0 LAB_R[2],J/T118L1 : CONTINUE TESTING
:2459
:2460
:2461 :////////////////////
:2462 :+
:2463 : BYTE 0---TWO SHIFT
:2464 :-
:2465
U 1025, 0018,0038,0980,0AA0,0000,1028 :2466 T118S2: R[4] K[.2] : SET THE LOOP COUNT
U 1028, 0000,003D,0180,0800,0000,134F :2467 =0 SUBTEST
U 1029, 0000,003C,0180,0A00,0000,1370 :2468 LAB R[0]
U 1370, 0018,0014,0580,0A80,0000,102A :2469 R[0]_LA+K[1] : SET NEW BYTE ADDRESS
U 102A, 0000,003D,6580,0A08,0000,1354 :2470 =0 LAB R[1],KMX/.10,CALL,J/SETUPOO : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 102B, 0000,003C,0180,AA18,0000,102C :2471 CACHE.P_D[LONG],LAB_R[3]
:2472
:2473 =0
U 102C, 0000,003D,0180,09F0,0000,1335 :2474 T118L2: ERLOOP,RC[0E]_LA : SAVE EXPECTED ADDRESS
U 102D, 0810,0038,0180,0970,0000,1030 :2475 D RC[0E] : PUT IT IN D REG
U 1030, 2000,003D,0180,0A08,4200,1364 :2476 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 1031, 0000,003C,0180,0800,0000,1032 :2477 NOP
:2478 =0
U 1032, 4000,003D,0180,0800,0000,1363 :2479 SYNC07: IBC/CLR.0.1,CALL,J/DISPAT : SEE IF BYTE 0 GETS THE CORRECT DATA
U 1033, 001D,A000,0180,0800,0010,1371 :2480 ALU Q-D,CLK.UBCC,BYTE : DATA OK?
U 1371, 0000,013C,0180,0A00,0200,1034 :2481 Z?,VA R[0] : BRANCH IF YES
U 1034, 0001,A03D,0180,09E8,0000,1336 :2482 =0 ERROR,RC[0D]_Q,BYTE :
U 1035, 0000,003C,0180,0800,0000,1038 :2483 NOP :
U 1038, 0000,003D,0180,0A08,0000,135A :2484 =0 LAB R[1],CALL,J/SETUPFF : WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1039, 0018,0000,0580,0AA0,0010,1372 :2485 R[4]_LA-K[1],CLK.UBCC : CHECK THE LOOP COUNT
U 1372, 0000,013C,0180,0800,0000,103A :2486 Z? : BRANCH IF LOOP FINISHED
U 103A, 0000,003C,0180,0A10,0000,102C :2487 =0 LAB_R[2],J/T118L2 : CONTINUE TESTING
:2488
:2489
:2490 :////////////////////
:2491 :+
:2492 : BYTE 0---FOUR SHIFT
:2493 :-
:2494
U 103B, 0018,0038,0980,0AA0,0000,103C :2495 T118S3: R[4] K[.2] : SET THE LOOP COUNT
U 103C, 0000,003D,0180,0800,0000,134F :2496 =0 SUBTEST
U 103D, 0000,003C,0180,0A00,0000,1373 :2497 LAB R[0]
U 1373, 0018,0014,0980,0A80,0000,1040 :2498 R[0]_LA+K[.2] : SET ADR OF NEW BYTE
U 1040, 0000,003D,6580,0A08,0000,1354 :2499 =0 LAB R[1],KMX/.10,CALL,J/SETUPOO : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1041, 0000,003C,0180,AA18,0000,1042 :2500 CACHE.P_D[LONG],LAB_R[3]
:2501
:2502 =0
U 1042, 0000,003D,0180,09F0,0000,1335 :2503 T118L3: ERLOOP,RC[0E]_LA : SAVE EXPECTED ADDRESS
U 1043, 0810,0038,0180,0970,0000,1044 :2504 D RC[0E] : PUT IT IN D REG
U 1044, 2000,003D,0180,0A08,4200,1364 :2505 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 1045, 0000,003C,0180,0800,0000,1046 :2506 NOP

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:2507
U 1046. E000.003D.0180.0800.0000.1363 :2508 =0
U 1047. 001D.A000.0180.0800.0010.1374 :2509 SYNC08: IBC/CLR.0-3,CALL,J/DISPAT : SEE IF BYTE 0 GETS THE CORRECT DATA
U 1374. 0000.013C.0180.0A00.0200.1048 :2510 ALU Q-D,CLK.UBCC,BYTE : DATA OK?
U 1048. 0001.A03D.0180.09E8.0000.1336 :2511 Z?,VA R[0] : BRANCH IF YES
U 1049. 0000.003C.0180.0800.0000.104A :2512 =0 ERROR,RC[0D],Q,BYTE :
U 104A. 0000.003D.0180.0A08.0000.135A :2513 NOP :
U 104B. 0018.0000.0580.0AA0.0010.1375 :2514 =0 LAB R[1],CALL,J/SETUPFF : WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1375. 0000.013C.0180.0800.0000.104C :2515 R[4],LA-K[.1],CLK.UBCC : CHECK THE LOOP COUNT
U 104C. 0000.003C.0180.0A10.0000.1042 :2516 Z? : BRANCH IF LOOP FINISHED
:2517 =0 LAB_R[2],J/T118L3 : CONTINUE TESTING
:2518
:2519 :////////////////////
:2520 :+
:2521 : BYTE 1---NO SHIFT
:2522 :-
:2523
U 104D. 0018.0038.0980.0AA0.0000.1050 :2524 T118S4: R[4],K[.2] : SET THE LOOP CNT
U 1050. 0000.003D.0180.0800.0000.134F :2525 =0 SUBTEST
U 1051. 0018.0038.0580.0A80.0000.1052 :2526 R[0],K[.1] : SET NEW BYTE ADDRESS
U 1052. 0000.003D.6580.0A08.0000.1354 :2527 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1053. 0000.003C.0180.0A18.0000.1054 :2528 CACHE.P_D[LONG],LAB_R[3]
:2529
:2530 =0
U 1054. 0000.003D.0180.09F0.0000.1335 :2531 T118L4: ERLOOP,RC[0E],LA : SAVE EXPECTED ADDRESS
U 1055. 0810.0038.0180.0970.0000.1056 :2532 D RC[0E] : PUT IT IN D REG
U 1056. 2000.003D.0180.0A08.4200.1364 :2533 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 1057. 0000.003C.0180.0800.0000.1058 :2534 SYNC09: NOP
U 1058. 0000.003D.0180.0800.0000.1363 :2535 =0 IBC/CLR.0,CALL,J/DISPAT : SEE IF BYTE 0 GETS THE CORRECT DATA
U 1059. 001D.A000.0180.0800.0010.1376 :2536 ALU Q-D,CLK.UBCC,BYTE : DATA OK?
U 1376. 0000.013C.0180.0A00.0200.105C :2537 Z?,VA R[0] : BRANCH IF YES
U 105C. 0001.A03D.0180.09E8.0000.1336 :2538 =0 ERROR,RC[0D],Q,BYTE :
U 105D. 0000.003C.0180.0800.0000.1060 :2539 NOP :
U 1060. 0000.003D.0180.0A08.0000.135A :2540 =0 LAB R[1],CALL,J/SETUPFF : WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1061. 0018.0000.0580.0AA0.0010.1377 :2541 R[4],LA-K[.1],CLK.UBCC : CHECK THE LOOP COUNT
U 1377. 0000.013C.0180.0800.0000.1062 :2542 Z? : BRANCH IF LOOP FINISHED
U 1062. 0000.003C.0180.0A10.0000.1054 :2543 =0 LAB_R[2],J/T118L4 : CONTINUE TESTING
:2544
:2545 :////////////////////
:2546 :+
:2547 : BYTE 1---ONE SHIFT
:2548 :-
:2549
:2550
U 1063. 0018.0038.0980.0AA0.0000.1064 :2551 T118S5: R[4],K[.2] : SET THE LOOP COUNT
U 1064. 0000.003D.0180.0800.0000.134F :2552 =0 SUBTEST
U 1065. 0000.003C.0180.0A00.0000.1378 :2553 LAB R[0]
U 1378. 0018.0014.0580.0A80.0000.1066 :2554 R[0],LA+K[.1] : SET NEW BYTE ADDRESS
U 1066. 0000.003D.6580.0A08.0000.1354 :2555 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1067. 0000.003C.0180.0A18.0000.1068 :2556 CACHE.P_D[LONG],LAB_R[3]
:2557
:2558 =0
U 1068. 0000.003D.0180.09F0.0000.1335 :2559 T118L5: ERLOOP,RC[0E],LA : SAVE EXPECTED ADDRESS
U 1069. 0810.0038.0180.0970.0000.106A :2560 D RC[0E] : PUT IT IN D REG
U 106A. 2000.003D.0180.0A08.4200.1364 :2561 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB

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U 106B, D000,003C,0180,0800,0000,106C :2562 SYNCOA: IBC/CLR.1
U 106C, C000,003D,0180,0800,0000,1363 :2563 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 106D, 001D,A000,0180,0800,0010,1379 :2564 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 1379, 0000,013C,0180,0A00,0200,106E :2565 Z?,VA R[0] ; BRANCH IF YES
U 106E, 0001,A03D,0180,09E8,0000,1336 :2566 =0 ERRORR,RC[0D],Q,BYTE ;
U 106F, 0000,003C,0180,0800,0000,1070 :2567 NOP ;
U 1070, 0000,003D,0180,0A08,0000,135A :2568 =0 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1071, 0018,0000,0580,0AA0,0010,137A :2569 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 137A, 0000,013C,0180,0800,0000,1072 :2570 Z? ; BRANCH IF LOOP FINISHED
U 1072, 0000,003C,0180,0A10,0000,1068 :2571 =0 LAB_R[2],J/T118L5 ; CONTINUE TESTING
:2572
:2573
:2574 :////////////////////
:2575 :+
:2576 : BYTE 1---TWO SHIFT
:2577 :-
:2578
U 1073, 0018,0038,0980,0AA0,0000,1074 :2579 T118S6: R[4] K[.2] ; SET THE LOOP COUNT
U 1074, 0000,003D,0180,0800,0000,134F :2580 =0 SUBTEST
U 1075, 0000,003C,0180,0A00,0000,137B :2581 LAB R[0]
U 137B, 0018,0014,0580,0A80,0000,1076 :2582 R[0] LA+K[.1] ; SET NEW BYTE ADDRESS
U 1076, 0000,003D,6580,0A08,0000,1354 :2583 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1077, 0000,003C,0180,AA18,0000,1078 :2584 CACHE.P_D[LONG],LAB_R[3]
:2585
:2586 =0
U 1078, 0000,003D,0180,09F0,0000,1335 :2587 T118L6: ERLOOP,RC[0E],LA ; SAVE EXPECTED ADDRESS
U 1079, 0810,0038,0180,0970,0000,107A :2588 D RC[0E] ; PUT IT IN D REG
U 107A, 2000,003D,0180,0A08,4200,1364 :2589 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 107B, 4000,003C,0180,0800,0000,107C :2590 SYNCOB: IBC7CLR.0.1
U 107C, C000,003D,0180,0800,0000,1363 :2591 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 107D, 001D,A000,0180,0800,0010,137C :2592 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 137C, 0000,013C,0180,0A00,0200,107E :2593 Z?,VA R[0] ; BRANCH IF YES
U 107E, 0001,A03D,0180,09E8,0000,1336 :2594 =0 ERRORR,RC[0D],Q,BYTE ;
U 107F, 0000,003C,0180,0800,0000,1080 :2595 NOP ;
U 1080, 0000,003D,0180,0A08,0000,135A :2596 =0 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1081, 0018,0000,0580,0AA0,0010,137D :2597 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 137D, 0000,013C,0180,0800,0000,1082 :2598 Z? ; BRANCH IF LOOP FINISHED
U 1082, 0000,003C,0180,0A10,0000,1078 :2599 =0 LAB_R[2],J/T118L6 ; CONTINUE TESTING
:2600
:2601
:2602 :////////////////////
:2603 :+
:2604 : BYTE 1---FOUR SHIFT
:2605 :-
:2606
U 1083, 0018,0038,0980,0AA0,0000,1084 :2607 T118S7: R[4] K[.2] ; SET THE LOOP COUNT
U 1084, 0000,003D,0180,0800,0000,134F :2608 =0 SUBTEST
U 1085, 0000,003C,0180,0A00,0000,137E :2609 LAB R[0]
U 137E, 0018,0014,0980,0A80,0000,1086 :2610 R[0] LA+K[.2] ; SET ADR OF NEW BYTE
U 1086, 0000,003D,6580,0A08,0000,1354 :2611 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1087, 0000,003C,0180,AA18,0000,137F :2612 CACHE.P_D[LONG],LAB_R[3]
U 137F, 0000,803C,0180,AA18,0000,1088 :2613 CACHE.P_D[BYTE],LAB_R[3] ; WRITE ZERO TO THE BYTE
:2614
:2615 =0
U 1088, 0000,003D,0180,09F0,0000,1335 :2616 T118L7: ERLOOP,RC[0E],LA ; SAVE EXPECTED ADDRESS

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U 1089. 0810,0038,0180,0970,0000,108A :2617 D RC[0E] ; PUT IT IN D REG
U 108A. 2000,003D,0180,0A08,4200,1364 :2618 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 108B. E000,003C,0180,0800,0000,108C :2619 SYNCOC: IBC7CLR.0-3
U 108C. C000,003D,0180,0800,0000,1363 :2620 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 108D. 001D,A000,0180,0800,0010,1380 :2621 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 1380. 0000,013C,0180,0A00,0200,108E :2622 Z?,VA RC[0] ; BRANCH IF YES
U 108E. 0001,A03D,0180,09E8,0000,1336 :2623 =0 ERRORT,RC[0D],Q,BYTE ;
U 108F. 0000,003C,0180,0800,0000,1090 :2624 NOP
U 1090. 0000,003D,0180,0A08,0000,135A :2625 =0 LAB RC[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1091. 0018,0000,0580,0AA0,0010,1381 :2626 RC[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 1381. 0000,013C,0180,0800,0000,1092 :2627 Z? ; BRANCH IF LOOP FINISHED
U 1092. 0000,003C,0180,0A10,0000,1088 :2628 =0 LAB_RC[2],J/T118L7 ; CONTINUE TESTING
:2629
:2630
:2631 :////////////////////
:2632 :+
:2633 : BYTE 2---NO SHIFT
:2634 :-
:2635
U 1093. 0018,0038,0980,0A80,0000,1094 :2636 T118S8: RC[0] K[.2] ; SET ADDRESS OF BYTE UNDER TEST
U 1094. 0000,003D,0180,0800,0000,134F :2637 =0 SUBTEST
U 1095. 0018,0038,0980,0AA0,0000,1096 :2638 RC[4] K[.2] ; SET THE LOOP COUNT
U 1096. 0000,003D,6580,0A08,0000,1354 :2639 =0 LAB RC[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1097. 0000,003C,0180,AA18,0000,1098 :2640 CACHE.P_D[LONG],LAB_RC[3]
:2641
:2642 =0
U 1098. 0000,003D,0180,09F0,0000,1335 :2643 T118L8: ERLOOP,RC[0E],LA ; SAVE EXPECTED ADDRESS
U 1099. 0810,0038,0180,0970,0000,109A :2644 D RC[0E] ; PUT IT IN D REG
U 109A. 2000,003D,0180,0A08,4200,1364 :2645 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 109B. 0000,003C,0180,0800,0000,109C :2646 SYNCOC: NOP
U 109C. 4000,003D,0180,0800,0000,1363 :2647 =0 IBC/CLR.0.1,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 109D. 001D,A000,0180,0800,0010,1382 :2648 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 1382. 0000,013C,0180,0A00,0200,109E :2649 Z?,VA RC[0] ; BRANCH IF YES
U 109E. 0001,A03D,0180,09E8,0000,1336 :2650 =0 ERRORT,RC[0D],Q,BYTE ;
U 109F. 0000,003C,0180,0800,0000,10A0 :2651 NOP
U 10A0. 0000,003D,0180,0A08,0000,135A :2652 =0 LAB RC[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10A1. 0018,0000,0580,0AA0,0010,1383 :2653 RC[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 1383. 0000,013C,0180,0800,0000,10A2 :2654 Z? ; BRANCH IF LOOP FINISHED
U 10A2. 0000,003C,0180,0A10,0000,1098 :2655 =0 LAB_RC[2],J/T118L8 ; CONTINUE TESTING
:2656
:2657
:2658 :////////////////////
:2659 :+
:2660 : BYTE 2---ONE SHIFT
:2661 :-
:2662
U 10A3. 0018,0038,0980,0AA0,0000,10A4 :2663 T118S9: RC[4] K[.2] ; SET THE LOOP COUNT
U 10A4. 0000,003D,0180,0800,0000,134F :2664 =0 SUBTEST
U 10A5. 0000,003C,0180,0A00,0000,1384 :2665 LAB RC[0]
U 1384. 0018,0014,0580,0A80,0000,10A6 :2666 RC[0] LA+K[.1] ; SET NEW BYTE ADDRESS
U 10A6. 0000,003D,6580,0A08,0000,1354 :2667 =0 LAB RC[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10A7. 0000,003C,0180,AA18,0000,10A8 :2668 CACHE.P_D[LONG],LAB_RC[3]
:2669
:2670 =0
U 10A8. 0000,003D,0180,09F0,0000,1335 :2671 T118L9: ERLOOP,RC[0E],LA ; SAVE EXPECTED ADDRESS

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U 10A9, 0810,0038,0180,0970,0000,10AA :2672      D RC[OE]                : PUT IT IN D REG
U 10AA, 2000,003D,0180,0A08,4200,1364 :2673      =0      ACU RC[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 10AB, D000,003C,0180,0800,0000,1385 :2674      SYNCOE: IBC7CLR.1
U 1385, C000,003C,0180,0800,0000,10AC :2675      IBC/CLR.0
U 10AC, C000,003D,0180,0800,0000,1363 :2676      =0      IBC/CLR.0,CALL,J/DISPAT           : SEE IF BYTE 0 GETS THE CORRECT DATA
U 10AD, 001D,A000,0180,0800,0010,1386 :2677      ALU Q-D,CLK.UBCC,BYTE           : DATA OK?
U 1386, 0000,013C,0180,0A00,0200,10AE :2678      Z?,VA R[0]                   : BRANCH IF YES
U 10AE, 0001,A03D,0180,09E8,0000,1336 :2679      =0      ERRORR,RC[OD],Q,BYTE
U 10AF, 0000,003C,0180,0800,0000,10B0 :2680      NOP
U 10B0, 0000,003D,0180,0A08,0000,135A :2681      =0      LAB RC[1],CALL,J/SETUPFF
U 10B1, 0018,0000,0580,0AA0,0010,1387 :2682      R[4],LA-K[.1],CLK.UBCC
U 1387, 0000,013C,0180,0800,0000,10B2 :2683      Z?
U 10B2, 0000,003C,0180,0A10,0000,10AB :2684      =0      LAB_RC[2],J/T118L9           : CONTINUE TESTING
:2685
:2686
:2687      :////////////////////
:2688      :+
:2689      : BYTE 2---TWO SHIFT
:2690      :-
:2691
U 10B3, 0018,0038,0980,0AA0,0000,10B4 :2692      T118SA: R[4],K[.2]                : SET THE LOOP COUNT
U 10B4, 0000,003D,0180,0800,0000,134F :2693      =0      SUBTEST
U 10B5, 0000,003C,0180,0A00,0000,1388 :2694      LAB RC[0]
U 1388, 0018,0014,0580,0A80,0000,10B6 :2695      R[0],LA+K[.1]                   : SET NEW BYTE ADDRESS
U 10B6, 0000,003D,6580,0A08,0000,1354 :2696      =0      LAB RC[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10B7, 0000,003C,0180,AA18,0000,10B8 :2697      CACRE.P_D[LONG],LAB_RC[3]
:2698
:2699      =0
U 10B8, 0000,003D,0180,09F0,0000,1335 :2700      T118L10: ERLOOP,RC[OE],LA           : SAVE EXPECTED ADDRESS
U 10B9, 0810,0038,0180,0970,0000,10BA :2701      D RC[OE]                : PUT IT IN D REG
U 10BA, 2000,003D,0180,0A08,4200,1364 :2702      =0      ACU RC[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 10BB, 4000,003C,0180,0800,0000,10BC :2703      SYNCOF: IBC7CLR.0.1
U 10BC, 4000,003D,0180,0800,0000,1363 :2704      =0      IBC/CLR.0.1,CALL,J/DISPAT           : SEE IF BYTE 0 GETS THE CORRECT DATA
U 10BD, 001D,A000,0180,0800,0010,1389 :2705      ALU Q-D,CLK.UBCC,BYTE           : DATA OK?
U 1389, 0000,013C,0180,0A00,0200,10BE :2706      Z?,VA R[0]                   : BRANCH IF YES
U 10BE, 0001,A03D,0180,09E8,0000,1336 :2707      =0      ERRORR,RC[OD],Q,BYTE
U 10BF, 0000,003C,0180,0800,0000,10C0 :2708      NOP
U 10C0, 0000,003D,0180,0A08,0000,135A :2709      =0      LAB RC[1],CALL,J/SETUPFF
U 10C1, 0018,0000,0580,0AA0,0010,138A :2710      R[4],LA-K[.1],CLK.UBCC
U 138A, 0000,013C,0180,0800,0000,10C2 :2711      Z?
U 10C2, 0000,003C,0180,0A10,0000,10B8 :2712      =0      LAB_RC[2],J/T118L10           : CONTINUE TESTING
:2713
:2714
:2715      :////////////////////
:2716      :+
:2717      : BYTE 2---FOUR SHIFT
:2718      :-
:2719
U 10C3, 0018,0038,0980,0AA0,0000,10C4 :2720      T118SB: R[4],K[.2]                : SET THE LOOP COUNT
U 10C4, 0000,003D,0180,0800,0000,134F :2721      =0      SUBTEST
U 10C5, 0000,003C,0180,0A00,0000,138B :2722      LAB RC[0]
U 138B, 0018,0014,0980,0A80,0000,10C6 :2723      R[0],LA+K[.2]                   : SET ADR OF NEW BYTE
U 10C6, 0000,003D,6580,0A08,0000,1354 :2724      =0      LAB RC[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10C7, 0000,003C,0180,AA18,0000,10C8 :2725      CACRE.P_D[LONG],LAB_RC[3]
:2726

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:2727 =0
U 10C8, 0000,003D,0180,09F0,0000,1335 :2728 T118L11:ERLOOP,RC[0E]_LA ; SAVE EXPECTED ADDRESS
U 10C9, 0810,0038,0180,0970,0000,10CA :2729 D RC[0E] ; PUT IT IN D REG
U 10CA, 2000,003D,0180,0A08,4200,1364 :2730 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10CB, E000,003C,0180,0800,0000,10CC :2731 SYNC10: IBC7CLR.0-3
U 10CC, 4000,003D,0180,0800,0000,1363 :2732 =0 IBC/CLR.0.1,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10CD, 001D,A000,0180,0800,0010,138C :2733 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
U 138C, 0000,013C,0180,0A00,0200,10CE :2734 Z?,VA R[0] ; BRANCH IF YES
U 10CE, 0001,A03D,0180,09E8,0000,1336 :2735 =0 ERRORI,RC[0D]_Q,BYTE
U 10CF, 0000,003C,0180,0800,0000,10D0 :2736 NOP
U 10D0, 0000,003D,0180,0A08,0000,135A :2737 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10D1, 0018,0000,0580,0000,0010,138D :2738 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 138D, 0000,013C,0180,0000,0000,10D2 :2739 Z? ; BRANCH IF LOOP FINISHED
U 10D2, 0000,003C,0180,0A10,0000,10C8 :2740 =0 LAB_R[2],J/T118L11 ; CONTINUE TESTING
:2741
:2742
:2743 :////////////////////
:2744 :+
:2745 : BYTE 3---ZERO SHIFT
:2746 :-
:2747
U 10D3, 0018,0038,0D80,0A80,0000,10D4 :2748 T118SC: R[0]_K[.3] ; SET ADR OF BYTE UNDER TEST
U 10D4, 0000,003D,0180,0800,0000,134F :2749 =0 SUBTEST
U 10D5, 0018,0038,0980,0AA0,0000,10D6 :2750 R[4]_K[.2] ; SET THE LOOP COUNT
U 10D6, 0000,003D,6580,0A08,0000,1354 :2751 =0 LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10D7, 0000,003C,0180,AA18,0000,10D8 :2752 CACHE.P_D[LONG],LAB_R[3]
:2753
:2754 =0
U 10D8, 0000,003D,0180,09F0,0000,1335 :2755 T118L12:ERLOOP,RC[0E]_LA ; SAVE EXPECTED ADDRESS
U 10D9, 0810,0038,0180,0970,0000,10DA :2756 D RC[0E] ; PUT IT IN D REG
U 10DA, 2000,003D,0180,0A08,4200,1364 :2757 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DB, 0000,003C,0180,0800,0000,138E :2758 SYNC11: NOP
U 138E, 4000,003C,0180,0800,0000,10DC :2759 IBC/CLR.0.1
U 10DC, C000,003D,0180,0800,0000,1363 :2760 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10DD, 001D,A000,0180,0800,0010,138F :2761 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
U 138F, 0000,013C,0180,0A00,0200,10DE :2762 Z?,VA R[0] ; BRANCH IF YES
U 10DE, 0001,A03D,0180,09E8,0000,1336 :2763 =0 ERRORI,RC[0D]_Q,BYTE
U 10DF, 0000,003C,0180,0800,0000,10E0 :2764 NOP
U 10E0, 0000,003D,0180,0A08,0000,135A :2765 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10E1, 0018,0000,0580,0AA0,0010,1390 :2766 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 1390, 0000,013C,0180,0800,0000,10E2 :2767 Z? ; BRANCH IF LOOP FINISHED
U 10E2, 0000,003C,0180,0A10,0000,10D8 :2768 =0 LAB_R[2],J/T118L12 ; CONTINUE TESTING
:2769
:2770
:2771 :////////////////////
:2772 :+
:2773 : BYTE 3---ONE SHIFT
:2774 :-
:2775
U 10E3, 0018,0038,0980,0AA0,0000,10E4 :2776 T118SD: R[4]_K[.2] ; SET THE LOOP COUNT
U 10E4, 0000,003D,0180,0800,0000,134F :2777 =0 SUBTEST
U 10E5, 0000,003C,0180,0A00,0000,1391 :2778 LAB_R[0]
U 1391, 0018,0014,0580,0A80,0000,10E6 :2779 R[0]_LA+K[.1] ; SET NEW BYTE ADDRESS
U 10E6, 0000,003D,6580,0A08,0000,1354 :2780 =0 LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10E7, 0000,003C,0180,AA18,0000,10E8 :2781 CACHE.P_D[LONG],LAB_R[3]

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:2782
:2783 =0
:2784 T118L13:ERLOOP,RC[0E]_LA ; SAVE EXPECTED ADDRESS
:2785 D RC[0E] ; PUT IT IN D REG
:2786 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2787 SYNC12: IBC7CLR.1
:2788 IBC/CLR.0.1
:2789 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
:2790 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
:2791 Z?,VA R[0] ; BRANCH IF YES
:2792 =0 ERROR1,RC[0D]_Q,BYTE ;
:2793 NOP
:2794 =0 LAB RC[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
:2795 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
:2796 Z? ; BRANCH IF LOOP FINISHED
:2797 =0 LAB_RC[2],J/T118L13 ; CONTINUE TESTING
:2798
:2799
:2800 :////////////////////
:2801 :+
:2802 : BYTE 3---TWO SHIFT
:2803 :-
:2804
:2805 T118SE: R[4] K[.2] ; SET THE LOOP COUNT
:2806 =0 SUBTEST
:2807 LAB RC[0]
:2808 R[0]_LA+K[.1] ; SET NEW BYTE ADDRESS
:2809 =0 LAB RC[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
:2810 CACHE.P_D[LONG],LAB_RC[3]
:2811
:2812 =0
:2813 T118L14:ERLOOP,RC[0E]_LA ; SAVE EXPECTED ADDRESS
:2814 D RC[0E] ; PUT IT IN D REG
:2815 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2816 SYNC13: IBC7CLR.0.1
:2817 IBC/CLR.0.1
:2818 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
:2819 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
:2820 Z?,VA R[0] ; BRANCH IF YES
:2821 =0 ERROR1,RC[0D]_Q,BYTE ;
:2822 NOP
:2823 =0 LAB RC[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
:2824 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
:2825 Z? ; BRANCH IF LOOP FINISHED
:2826 =0 LAB_RC[2],J/T118L14 ; CONTINUE TESTING
:2827
:2828
:2829 :////////////////////
:2830 :+
:2831 : BYTE 3---FOUR SHIFT
:2832 :-
:2833
:2834 T118SF: R[4] K[.2] ; SET THE LOOP COUNT
:2835 =0 SUBTEST
:2836 LAB RC[0]

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U 10E8, 0000,003D,0180,09F0,0000,1335
U 10E9, 0810,0038,0180,0970,0000,10EA
U 10EA, 2000,003D,0180,0A08,4200,1364
U 10EB, D000,003C,0180,0800,0000,1392
U 1392, 4000,003C,0180,0800,0000,10EC
U 10EC, C000,003D,0180,0800,0000,1363
U 10ED, 001D,A000,0180,0800,0010,1393
U 1393, 0000,013C,0180,0A00,0200,10EE
U 10EE, 0001,A03D,0180,09E8,0000,1336
U 10EF, 0000,003C,0180,0800,0000,10F0
U 10F0, 0000,003D,0180,0A08,0000,135A
U 10F1, 0018,0000,0580,0AA0,0010,1394
U 1394, 0000,013C,0180,0800,0000,10F2
U 10F2, 0000,003C,0180,0A10,0000,10E8

U 10F3, 0018,0038,0980,0AA0,0000,10F4
U 10F4, 0000,003D,0180,0800,0000,134F
U 10F5, 0000,003C,0180,0A00,0000,1395
U 1395, 0018,0014,0580,0A80,0000,10F6
U 10F6, 0000,003D,6580,0A08,0000,1354
U 10F7, 0000,003C,0180,AA18,0000,10F8

U 10F8, 0000,003D,0180,09F0,0000,1335
U 10F9, 0810,0038,0180,0970,0000,10FA
U 10FA, 2000,003D,0180,0A08,4200,1364
U 10FB, 4000,003C,0180,0800,0000,1396
U 1396, 4000,003C,0180,0800,0000,10FC
U 10FC, C000,003D,0180,0800,0000,1363
U 10FD, 001D,A000,0180,0800,0010,1397
U 1397, 0000,013C,0180,0A00,0200,10FE
U 10FE, 0001,A03D,0180,09E8,0000,1336
U 10FF, 0000,003C,0180,0800,0000,110A
U 110A, 0000,003D,0180,0A08,0000,135A
U 110B, 0018,0000,0580,0AA0,0010,1398
U 1398, 0000,013C,0180,0800,0000,1110
U 1110, 0000,003C,0180,0A10,0000,10F8

U 1111, 0018,0038,0980,0AA0,0000,1112
U 1112, 0000,003D,0180,0800,0000,134F
U 1113, 0000,003C,0180,0A00,0000,1399


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U 1399, 0018,0014,0980,0A80,0000,1114 :2837
U 1114, 0000,003D,6580,0A08,0000,1354 :2838
U 1115, 0000,003C,0180,AA18,0000,1116 :2839
:2840
:2841
U 1116, 0000,003D,0180,09F0,0000,1335 :2842
U 1117, 0810,0038,0180,0970,0000,1118 :2843
U 1118, 2000,003D,0180,0A08,4200,1364 :2844
U 1119, E000,003C,0180,0800,0000,139A :2845
U 139A, 4000,003C,0180,0800,0000,111A :2846
U 111A, C000,003D,0180,0800,0000,1363 :2847
U 111B, 001D,A000,0180,0800,0010,139B :2848
U 139B, 0000,013C,0180,0A00,0200,111C :2849
U 111C, 0001,A03D,0180,09E8,0000,1336 :2850
U 111D, 0000,003C,0180,0800,0000,111E :2851
U 111E, 0000,003D,0180,0A08,0000,135A :2852
U 111F, 0018,0000,0580,0AA0,0010,139C :2853
U 139C, 0000,013C,0180,0800,0000,1120 :2854
U 1120, 0000,003C,0180,0A10,0000,1116 :2855
:2856
:2857
:2858
:2859
:2860
:2861
:2862
U 1121, 0018,0038,1180,0A80,0000,1122 :2863
U 1122, 0000,003D,0180,0800,0000,134F :2864
U 1123, 0018,0038,0980,0AA0,0000,1124 :2865
U 1124, 0000,003D,6580,0A08,0000,1354 :2866
U 1125, 0000,003C,0180,AA18,0000,1126 :2867
:2868
:2869
U 1126, 0000,003D,0180,09F0,0000,1335 :2870
U 1127, 0810,0038,0180,0970,0000,1128 :2871
U 1128, 2000,003D,0180,0A08,4200,1364 :2872
U 1129, 0000,003C,0180,0800,0000,112A :2873
U 112A, E000,003D,0180,0800,0000,1363 :2874
U 112B, 001D,A000,0180,0800,0010,139D :2875
U 139D, 0000,013C,0180,0A00,0200,112C :2876
U 112C, 0001,A03D,0180,09E8,0000,1336 :2877
U 112D, 0000,003C,0180,0800,0000,112E :2878
U 112E, 0000,003D,0180,0A08,0000,135A :2879
U 112F, 0018,0000,0580,0AA0,0010,139E :2880
U 139E, 0000,013C,0180,0800,0000,1130 :2881
U 1130, 0000,003C,0180,0A10,0000,1126 :2882
:2883
:2884
:2885
:2886
:2887
:2888
:2889
U 1131, 0018,0038,0980,0AA0,0000,1132 :2890
U 1132, 0000,003D,0180,0800,0000,134F :2891

:2837 R[0],LA+K[.2] ; SET ADR OF NEW BYTE
:2838 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
:2839 CACRE.P_D[LONG],LAB_R[3]
:2840
:2841
:2842 T118L15:ERLOOP,RC[OE],LA ; SAVE EXPECTED ADDRESS
:2843 D,RC[OE] ; PUT IT IN D REG
:2844 A[U,R[1]],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2845 SYNC14: IBC7CLR.0-3
:2846 IBC/CLR.0.1
:2847 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
:2848 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
:2849 Z?,VA R[0] ; BRANCH IF YES
:2850 ERRORR,RC[OD],Q,BYTE
:2851 NOP
:2852 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
:2853 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
:2854 Z? ; BRANCH IF LOOP FINISHED
:2855 LAB_R[2],J/T118L15 ; CONTINUE TESTING
:2856
:2857
:2858
:2859
:2860
:2861
:2862
:2863 T118S10:R[0],K[.4] ; SET ADR OF BYTE UNDER TEST
:2864 SUBTEST
:2865 R[4],K[.2] ; SET THE LOOP COUNT
:2866 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
:2867 CACRE.P_D[LONG],LAB_R[3]
:2868
:2869
:2870 T118L16:ERLOOP,RC[OE],LA ; SAVE EXPECTED ADDRESS
:2871 D,RC[OE] ; PUT IT IN D REG
:2872 A[U,R[1]],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2873 SYNC15: NOP
:2874 IBC/CLR.0-3,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
:2875 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
:2876 Z?,VA R[0] ; BRANCH IF YES
:2877 ERRORR,RC[OD],Q,BYTE
:2878 NOP
:2879 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
:2880 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
:2881 Z? ; BRANCH IF LOOP FINISHED
:2882 LAB_R[2],J/T118L16 ; CONTINUE TESTING
:2883
:2884
:2885
:2886
:2887
:2888
:2889
:2890 T118S11:R[4],K[.2] ; SET THE LOOP COUNT
:2891 SUBTEST

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U 1133. 0000.003C.0180.0A00.0000.139F :2892
U 139F. 0018.0014.0580.0A80.0000.1134 :2893
U 1134. 0000.003D.6580.0A08.0000.1354 :2894
U 1135. 0000.003C.0180.0A18.0000.1136 :2895
:2896
:2897
U 1136. 0000.003D.0180.09F0.0000.1335 :2898
U 1137. 0810.0038.0180.0970.0000.1138 :2899
U 1138. 2000.003D.0180.0A08.4200.1364 :2900
U 1139. 0000.003C.0180.0800.0000.13A0 :2901
U 13A0. 0000.003C.0180.0800.0000.13A1 :2902
U 13A1. 0000.003C.0180.0800.0000.113A :2903
U 113A. 4000.003D.0180.0800.0000.1363 :2904
U 113B. 001D.0A00.0180.0800.0010.13A2 :2905
U 13A2. 0000.013C.0180.0A00.0200.113C :2906
U 113C. 0001.0A3D.0180.09E8.0000.1336 :2907
U 113D. 0000.003C.0180.0800.0000.113E :2908
U 113E. 0000.003D.0180.0A08.0000.135A :2909
U 113F. 0018.0000.0580.0AA0.0010.13A3 :2910
U 13A3. 0000.013C.0180.0800.0000.1140 :2911
U 1140. 0000.003C.0180.0A10.0000.1136 :2912
:2913
:2914
:2915
:2916
:2917
:2918
:2919
U 1141. 0018.0038.0980.0AA0.0000.1142 :2920
U 1142. 0000.003D.0180.0800.0000.134F :2921
U 1143. 0000.003C.0180.0A00.0000.13A4 :2922
U 13A4. 0018.0014.0580.0A80.0000.1144 :2923
U 1144. 0000.003D.6580.0A08.0000.1354 :2924
U 1145. 0000.003C.0180.0A18.0000.1146 :2925
:2926
:2927
U 1146. 0000.003D.0180.09F0.0000.1335 :2928
U 1147. 0810.0038.0180.0970.0000.1148 :2929
U 1148. 2000.003D.0180.0A08.4200.1364 :2930
U 1149. 4000.003C.0180.0800.0000.114A :2931
U 114A. 0000.003D.0180.0800.0000.1363 :2932
U 114B. 001D.0A00.0180.0800.0010.13A5 :2933
U 13A5. 0000.013C.0180.0A00.0200.114C :2934
U 114C. 0001.0A3D.0180.09E8.0000.1336 :2935
U 114D. 0000.003C.0180.0800.0000.114E :2936
U 114E. 0000.003D.0180.0A08.0000.135A :2937
U 114F. 0018.0000.0580.0AA0.0010.13A6 :2938
U 13A6. 0000.013C.0180.0800.0000.1150 :2939
U 1150. 0000.003C.0180.0A10.0000.1146 :2940
:2941
:2942
:2943
:2944
:2945
:2946

LAB_R[0]
R[0]_LA+K[.1] ; SET NEW BYTE ADDRESS
LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
CACHE.P_D[LONG],LAB_R[3]

=0
T118L17:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
D_R[0E] ; PUT IT IN D REG
A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
SYNC16: IBC7CLR.1
IBC/CLR.0
IBC/CLR.0
IBC/CLR.0.1,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
Z?,VA_R[0] ; BRANCH IF YES
ERRORT,R[0D]_Q,BYTE
NOP
LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
Z? ; BRANCH IF LOOP FINISHED
LAB_R[2],J/T118L17 ; CONTINUE TESTING

:////////////////////
:
: BYTE 4---TWO SHIFT
:-

T118S12:R[4] K[.2] ; SET THE LOOP COUNT
=0 SUBTEST
LAB_R[0]
R[0]_LA+K[.1] ; SET NEW BYTE ADDRESS
LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
CACHE.P_D[LONG],LAB_R[3]

=0
T118L18:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
D_R[0E] ; PUT IT IN D REG
A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
SYNC17: IBC7CLR.0.1
IBC/CLR.0-3,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
Z?,VA_R[0] ; BRANCH IF YES
ERRORT,R[0D]_Q,BYTE
NOP
LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
Z? ; BRANCH IF LOOP FINISHED
LAB_R[2],J/T118L18 ; CONTINUE TESTING

:////////////////////
:
: BYTE 4---FOUR SHIFT
:-

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:2947
U 1151, 0018,0038,0980,0AA0,0000,1152 :2948 T118S13:R[4]_K[.2] ; SET THE LOOP COUNT
U 1152, 0818,0039,5D80,0800,0000,1348 :2949 =0 D_K[.7],CALL,J/DCE
U 1153, 0001,003C,0180,0AA8,0000,13A7 :2950 R[5]_D ; SAVE
U 13A7, 0001,003C,0180,0A98,0000,1156 :2951 R[3]_D ; SET EXP ADR TO INVALID OP CODE
U 1156, 0000,003D,0180,0800,0000,134F :2952 =0 SUBTEST
U 1157, 0000,003C,0180,0A00,0000,13A8 :2953 LAB R[0]
U 13A8, 0018,0014,0980,0A80,0000,1158 :2954 R[0]_LA+K[.2] ; SET ADR OF NEW BYTE
U 1158, 0000,003D,6580,0A08,0000,1354 :2955 =0 LAB R[1],KMX7.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1159, 0000,003C,0180,AA18,0000,115A :2956 CACHE.P_D[LONG],LAB_R[3]
:2957
:2958 =0
U 115A, 0000,003D,0180,09F0,0000,1335 :2959 T118L19:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
U 115B, 0810,0038,0180,0970,0000,115C :2960 D_R[0E] ; PUT IT IN D REG
U 115C, 2000,003D,0180,0A08,4200,1364 :2961 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 115D, E000,003C,0180,0800,0000,115E :2962 SYNC18: IBC7CLR.0-3
U 115E, E000,003D,0180,0800,0000,1363 :2963 =0 IBC/CLR.0-3,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 115F, 001D,A000,0180,0800,0010,13A9 :2964 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
U 13A9, 0000,013C,0180,0A00,0200,1160 :2965 Z?,VA_R[0] ; BRANCH IF YES
U 1160, 0001,A03D,0180,09E8,0000,1336 :2966 =0 ERRORT,R[0D]_Q,BYTE ;
U 1161, 0000,003C,0180,0800,0000,1162 :2967 NOP
U 1162, 0000,003D,0180,0A08,0000,135A :2968 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1163, 0018,0000,0580,0AA0,0010,13AA :2969 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 13AA, 0000,013C,0180,0800,0000,1164 :2970 Z? ; BRANCH IF LOOP FINISHED
U 1164, 0000,003C,0180,0A18,0000,115A :2971 =0 LAB_R[3],J/T118L19 ; CONTINUE TESTING
U 1165, 0000,003C,0180,0800,0000,1166 :2972 NOP
:2973
:2974
:2975 ;////////////////////
:2976 ;+
:2977 ; BYTE 5---ZERO SHIFT
:2978 ;-
:2979
:2980 =0
U 1166, 0818,0038,1180,0800,0000,1167 :2981 T118S14:D_K[.4]
U 1167, 0019,0014,0580,0A80,0000,1168 :2982 R[0]_D+K[.1]
U 1168, 0000,003D,0180,0800,0000,134F :2983 =0 SUBTEST
U 1169, 0018,0038,0980,0AA0,0000,13AB :2984 R[4]_K[.2] ; SET THE LOOP COUNT
U 13AB, 0018,0038,1D80,0A98,0000,116A :2985 R[3]_ALU,ALU_SC ; SET EXP ADDRESS
U 116A, 0000,003D,6580,0A08,0000,1354 :2986 =0 LAB_R[1],KMX7.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 116B, 0000,003C,0180,AA18,0000,116C :2987 CACHE.P_D[LONG],LAB_R[3]
:2988
:2989 =0
U 116C, 0000,003D,0180,09F0,0000,1335 :2990 T118L20:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
U 116D, 0810,0038,0180,0970,0000,116E :2991 D_R[0E] ; PUT IT IN D REG
U 116E, 2000,003D,0180,0A08,4200,1364 :2992 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 116F, 0000,003C,0180,0800,0000,13AC :2993 SYNC19: NOP
U 13AC, E000,003C,0180,0800,0000,1170 :2994 IBC/CLR.0-3
U 1170, C000,003D,0180,0800,0000,1363 :2995 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1171, 001D,A000,0180,0800,0010,13AD :2996 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
U 13AD, 0000,013C,0180,0A00,0200,1172 :2997 Z?,VA_R[0] ; BRANCH IF YES
U 1172, 0001,A03D,0180,09E8,0000,1336 :2998 =0 ERRORT,R[0D]_Q,BYTE ;
U 1173, 0000,003C,0180,0800,0000,1174 :2999 NOP
U 1174, 0000,003D,0180,0A08,0000,135A :3000 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1175, 0018,0000,0580,0AA0,0010,13AE :3001 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT

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U 13AE, 0000,013C,0180,0800,0000,1176 :3002      Z?      : BRANCH IF LOOP FINISHED
U 1176, 0000,003C,0180,0A10,0000,116C :3003      =0      LAB_R[2],J/T118L20 : CONTINUE TESTING
:3004
:3005
:3006 :////////////////////
:3007 :+
:3008 : BYTE 5---ONE SHIFT
:3009 :-
:3010
U 1177, 0018,0038,0980,0AA0,0000,1178 :3011 T118S15:R[4] K[.2] : SET THE LOOP COUNT
U 1178, 0000,003D,0180,0800,0000,134F :3012      =0      SUBTEST
U 1179, 0000,003C,0180,0A00,0000,13AF :3013      LAB_R[0]
U 13AF, 0018,0014,0580,0A80,0000,117A :3014      R[0] LA+K[.1] : SET NEW BYTE ADDRESS
U 117A, 0000,003D,6580,0A08,0000,1354 :3015      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 117B, 0000,003C,0180,AA18,0000,117C :3016      CACHE.P_D[LONG],LAB_R[3]
:3017
:3018      =0
U 117C, 0000,003D,0180,09F0,0000,1335 :3019 T118L21:ERLOOP,RC[0E]_LA : SAVE EXPECTED ADDRESS
U 117D, 0810,0038,0180,0970,0000,117E :3020      D RC[0E] : PUT IT IN D REG
U 117E, 2000,003D,0180,0A08,4200,1364 :3021      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 117F, D000,003C,0180,0800,0000,1380 :3022 SYNC1A: IBC7CLR.1
U 1380, E000,003C,0180,0800,0000,1180 :3023      IBC/CLR.0-3
U 1180, C000,003D,0180,0800,0000,1363 :3024      =0      IBC/CLR.0,CALL,J/DISPAT : SEE IF BYTE 0 GETS THE CORRECT DATA
U 1181, 001D,A000,0180,0800,0010,13B1 :3025      ALU Q-D,CLK.UBCC,BYTE : DATA OK?
U 13B1, 0000,013C,0180,0A00,0200,1182 :3026      Z?,VA R[0] : BRANCH IF YES
U 1182, 0001,A03D,0180,09E8,0000,1336 :3027      =0      ERRORT,RC[0D]_Q,BYTE
U 1183, 0000,003C,0180,0800,0000,1184 :3028      NOP
U 1184, 0000,003D,0180,0A08,0000,135A :3029      =0      LAB_R[1],CALL,J/SETUPFF : WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1185, 0018,0000,0580,0AA0,0010,13B2 :3030      R[4]_LA-K[.1],CLK.UBCC : CHECK THE LOOP COUNT
U 13B2, 0000,013C,0180,0800,0000,1186 :3031      Z? : BRANCH IF LOOP FINISHED
U 1186, 0000,003C,0180,0A10,0000,117C :3032      =0      LAB_R[2],J/T118L21 : CONTINUE TESTING
:3033
:3034 :////////////////////
:3035 :+
:3036 : BYTE 5---TWO SHIFT
:3037 :-
:3038
:3039
U 1187, 0018,0038,0980,0AA0,0000,1188 :3040 T118S16:R[4] K[.2] : SET THE LOOP COUNT
U 1188, 0000,003D,0180,0800,0000,134F :3041      =0      SUBTEST
U 1189, 0000,003C,0180,0A00,0000,13B3 :3042      LAB_R[0]
U 13B3, 0018,0014,0580,0A80,0000,118A :3043      R[0] LA+K[.1] : SET NEW BYTE ADDRESS
U 118A, 0000,003D,6580,0A08,0000,1354 :3044      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 : WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 118B, 0000,003C,0180,AA18,0000,118C :3045      CACHE.P_D[LONG],LAB_R[3]
:3046
:3047      =0
U 118C, 0000,003D,0180,09F0,0000,1335 :3048 T118L22:ERLOOP,RC[0E]_LA : SAVE EXPECTED ADDRESS
U 118D, 0810,0038,0180,0970,0000,118E :3049      D RC[0E] : PUT IT IN D REG
U 118E, 2000,003D,0180,0A08,4200,1364 :3050      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 118F, 4000,003C,0180,0800,0000,13B4 :3051 SYNC1B: IBC7CLR.0.1
U 13B4, E000,003C,0180,0800,0000,1190 :3052      IBC/CLR.0-3
U 1190, C000,003D,0180,0800,0000,1363 :3053      =0      IBC/CLR.0,CALL,J/DISPAT : SEE IF BYTE 0 GETS THE CORRECT DATA
U 1191, 001D,A000,0180,0800,0010,13B5 :3054      ALU Q-D,CLK.UBCC,BYTE : DATA OK?
U 13B5, 0000,013C,0180,0A00,0200,1192 :3055      Z?,VA R[0] : BRANCH IF YES
U 1192, 0001,A03D,0180,09E8,0000,1336 :3056      =0      ERRORT,RC[0D]_Q,BYTE

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U 1193, 0000,003C,0180,0800,0000,1194 :3057 NOP
U 1194, 0000,003D,0180,0A08,0000,135A :3058 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1195, 0018,0000,0580,0AA0,0010,1386 :3059 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 1386, 0000,013C,0180,0800,0000,1196 :3060 Z? ; BRANCH IF LOOP FINISHED
U 1196, 0000,003C,0180,0A10,0000,118C :3061 =0 LAB_R[2],J/T118L22 ; CONTINUE TESTING
:3062
:3063
:3064 :////////////////////
:3065 :+
:3066 : BYTE 5---FOUR SHIFT
:3067 :-
:3068
U 1197, 0018,0038,0980,0AA0,0000,1198 :3069 T118S17:R[4]_K[.2] ; SET THE LOOP COUNT
U 1198, 0000,003D,0180,0800,0000,134F :3070 =0 SUBTEST
U 1199, 0000,003C,0180,0A28,0000,13B7 :3071 LAB_R[5] ; GET INVALID OP CODE ADR
U 13B7, 0000,003C,0180,0A98,0000,13B8 :3072 R[3]_LA ; SET EXP ADDRESS
U 13B8, 0000,003C,0180,0A00,0000,13B9 :3073 LAB_R[0]
U 13B9, 0018,0014,0980,0A80,0000,119A :3074 R[0]_LA+K[.2] ; SET ADR OF NEW BYTE
U 119A, 0000,003D,6580,0A08,0000,1354 :3075 =0 LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 119B, 0000,003C,0180,AA18,0000,119C :3076 CACHE.P_D[LONG],LAB_R[3]
:3077
:3078 =0
:3079 T118L23:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
U 119D, 0810,0038,0180,0970,0000,119E :3080 D_R[0E] ; PUT IT IN D REG
U 119E, 2000,003D,0180,0A08,4200,1364 :3081 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 119F, E000,003C,0180,0800,0000,138A :3082 SYNC1C: IBC7CLR.0-3
U 138A, E000,003C,0180,0800,0000,11A0 :3083 IBC/CLR.0-3
U 11A0, C000,003D,0180,0800,0000,1363 :3084 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11A1, 001D,A000,0180,0800,0010,138B :3085 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
U 138B, 0000,013C,0180,0A00,0200,11A2 :3086 Z?,VA_R[0] ; BRANCH IF YES
U 11A2, 0001,A03D,0180,09E8,0000,1336 :3087 =0 ERROR1,R[0D]_Q,BYTE
U 11A3, 0000,003C,0180,0800,0000,11A4 :3088 NOP
U 11A4, 0000,003D,0180,0A08,0000,135A :3089 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11A5, 0018,0000,0580,0AA0,0010,138C :3090 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 138C, 0000,013C,0180,0800,0000,11A6 :3091 Z? ; BRANCH IF LOOP FINISHED
U 11A6, 0000,003C,0180,0A18,0000,119C :3092 =0 LAB_R[3],J/T118L23 ; CONTINUE TESTING
:3093
:3094
:3095 :////////////////////
:3096 :+
:3097 : BYTE 6---ZERO SHIFT
:3098 :-
:3099
U 11A7, 0018,0038,D580,0A80,0000,11AB :3100 T118S18:R[0]_K[.6] ; SET NEW BYTE ADDRESS
U 11A8, 0000,003D,0180,0800,0000,134F :3101 =0 SUBTEST
U 11A9, 0018,0038,0980,0AA0,0000,13BD :3102 R[4]_K[.2] ; SET THE LOOP COUNT
U 13BD, 0018,0038,1D80,0A98,0000,11AA :3103 R[3]_ALU,ALU_SC
U 11AA, 0000,003D,6580,0A08,0000,1354 :3104 =0 LAB_R[1],KMX7.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11AB, 0000,003C,0180,AA18,0000,11AC :3105 CACHE.P_D[LONG],LAB_R[3]
:3106
:3107 =0
:3108 T118L24:ERLOOP,R[0E]_LA ; SAVE EXPECTED ADDRESS
U 11AD, 0810,0038,0180,0970,0000,11AE :3109 D_R[0E] ; PUT IT IN D REG
U 11AE, 2000,003D,0180,0A08,4200,1364 :3110 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11AF, 0000,003C,0180,0800,0000,13BE :3111 SYNC1D: NOP

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U 13BE, E000,003C,0180,0800,0000,11B0 :3112 IBC/CLR.0-3
U 11B0, 4000,003D,0180,0800,0000,1363 :3113 =0 IBC/CLR.0.1,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11B1, 001D,A000,0180,0800,0010,13BF :3114 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 13BF, 0000,013C,0180,0A00,0200,11B2 :3115 Z?,VA R[0] ; BRANCH IF YES
U 11B2, 0001,A03D,0180,09E8,0000,1336 :3116 =0 ERRORT,RC[0D],Q,BYTE ;
U 11B3, 0000,003C,0180,0800,0000,11B4 :3117 NOP
U 11B4, 0000,003D,0180,0A08,0000,135A :3118 =0 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11B5, 0018,0000,0580,0AA0,0010,13C0 :3119 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 13C0, 0000,013C,0180,0800,0000,11B6 :3120 Z? ; BRANCH IF LOOP FINISHED
U 11B6, 0000,003C,0180,0A10,0000,11AC :3121 =0 LAB_R[2],J/T118L24 ; CONTINUE TESTING
:3122
:3123
:3124 :////////////////////
:3125 :+
:3126 : BYTE 6---ONE SHIFT
:3127 :-
:3128
U 11B7, 0018,0038,0980,0AA0,0000,11B8 :3129 T118S19:R[4],K[.2] ; SET THE LOOP COUNT
U 11B8, 0000,003D,0180,0800,0000,134F :3130 =0 SUBTEST
U 11B9, 0000,003C,0180,0A00,0000,13C1 :3131 LAB R[0]
U 13C1, 0018,0014,0580,0A80,0000,11BA :3132 R[0],LA+K[.1] ; SET NEW BYTE ADDRESS
U 11BA, 0000,003D,0580,0A08,0000,1354 :3133 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11BB, 0000,003C,0180,AA18,0000,11BC :3134 CACHE.P_D[LONG],LAB_R[3]
:3135
:3136 =0
U 11BC, 0000,003D,0180,09F0,0000,1335 :3137 T118L25:ERLOOP,RC[0E],LA ; SAVE EXPECTED ADDRESS
U 11BD, 0810,0038,0180,0970,0000,11BE :3138 D RC[0E] ; PUT IT IN D REG
U 11BE, 2000,003D,0180,0A08,4200,1364 :3139 =0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11BF, D000,003C,0180,0800,0000,13C2 :3140 SYNC1E: IBC7CLR.1
U 13C2, E000,003C,0180,0800,0000,13C3 :3141 IBC/CLR.0-3
U 13C3, C000,003C,0180,0800,0000,11C0 :3142 IBC/CLR.0
U 11C0, C000,003D,0180,0800,0000,1363 :3143 =0 IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11C1, 001D,A000,0180,0800,0010,13C4 :3144 ALU Q-D,CLK.UBCC,BYTE ; DATA OK?
U 13C4, 0000,013C,0180,0A00,0200,11C2 :3145 Z?,VA R[0] ; BRANCH IF YES
U 11C2, 0001,A03D,0180,09E8,0000,1336 :3146 =0 ERRORT,RC[0D],Q,BYTE ;
U 11C3, 0000,003C,0180,0800,0000,11C4 :3147 NOP
U 11C4, 0000,003D,0180,0A08,0000,135A :3148 =0 LAB R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11C5, 0018,0000,0580,0AA0,0010,13C5 :3149 R[4],LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
U 13C5, 0000,013C,0180,0800,0000,11C6 :3150 Z? ; BRANCH IF LOOP FINISHED
U 11C6, 0000,003C,0180,0A10,0000,11BC :3151 =0 LAB_R[2],J/T118L25 ; CONTINUE TESTING
:3152
:3153
:3154 :////////////////////
:3155 :+
:3156 : BYTE 6---TWO SHIFT
:3157 :-
:3158
U 11C7, 0018,0038,0980,0AA0,0000,11C8 :3159 T118S1A:R[4],K[.2] ; SET THE LOOP COUNT
U 11C8, 0000,003D,0180,0800,0000,134F :3160 =0 SUBTEST
U 11C9, 0000,003C,0180,0A28,0000,13C6 :3161 LAB R[5]
U 13C6, 0000,003C,0180,0A98,0000,13C7 :3162 R[3],LA
U 13C7, 0000,003C,0180,0A00,0000,13C8 :3163 LAB R[0]
U 13C8, 0018,0014,0580,0A80,0000,11CA :3164 R[0],LA+K[.1] ; SET NEW BYTE ADDRESS
U 11CA, 0000,003D,0580,0A08,0000,1354 :3165 =0 LAB R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11CB, 0000,003C,0180,AA18,0000,11CC :3166 CACHE.P_D[LONG],LAB_R[3]

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:3167
:3168 =0
:3169 T118L26:ERLOOP,RC[OE]_LA ; SAVE EXPECTED ADDRESS
:3170 D RC[OE] ; PUT IT IN D REG
:3171 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:3172 SYNC1F: IBC7CLR.0.1
:3173 IBC/CLR.0-3
:3174 =0 IBC/CLR.0.1,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
:3175 ALU_Q-D,CLK.UBCC,BYTE ; DATA OK?
:3176 Z?,VA_R[0] ; BRANCH IF YES
:3177 =0 ERROR1,RC[OD]_Q,BYTE ;
:3178 NOP
:3179 =0 LAB_R[1],CALL,J/SETUPFF ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
:3180 R[4]_LA-K[.1],CLK.UBCC ; CHECK THE LOOP COUNT
:3181 Z? ; BRANCH IF LOOP FINISHED
:3182 =0 LAB_R[3],J/T118L26 ; CONTINUE TESTING
:3183 NOP
:3184
:3185
:3186 ; THE FOLLOWING DATA IS THE IB DATA PATTERN FOR THE ABOVE TEST:
:3187 :X 0
:3188 :$ FFFF,FFFF,FFFF,FFFF
:3189 :$ 0000,0000,0000,0000
:3190
:3191
    
```


U 11D8, 0000,003D,0180,0800,0000,105F
U 11D9, 0818,0038,1180,0800,0000,13CC
U 13CC, 0019,0014,0580,09F8,0000,13CD
U 13CD, 0018,0038,2180,0A88,0000,11DA

3192
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3202
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```

PAGE "TEST 119 VALID BIT GENERATION"
*****
++
TEST 119 VALID BIT GENERATION

TEST DESCRIPTION
THIS TEST CHECKS THAT THE CORRECT BYTES ARE MARKED VALID, WHEN
THEY ARE RECEIVED FROM THE CACHE, AS A FUNCTION OF THE VALUES
OF IBA BITS<1:0>. THIS IS DONE BY LOADING THE IBA WITH THE SPECIFIED
VALUE OF BITS<1:0>, STARTING THE INSTRUCTION BUFFER, WAITING FOR
THE SPECIFIED NUMBER OF CYCLES, FROM THE CACHE, STOPPING THE IB,
AND CHECKING THAT THE APPROPRIATE BYTES WERE MARKED VALID.

SUBTST 1 - CHECK THAT IBA BITS<1:0> VALUES OF 00,01,10, AND 11 AND
ONLY ONE CACHE READ, VALIDATE BYTES 3-0,2-0,1-0,
AND 0, RESPECTIVELY.
SUBTST 2 - CHECK THAT AN IBA VALUE OF 11 AND 2 READS FROM THE CACHE
ONLY VALIDATE BYTES 4-0.
SUBTST 3 - CHECK THAT AN IBA VALUE OF 10 AND 2 READS FROM THE CACHE
ONLY VALIDATE BYTES 5-0.
SUBTST 4 - CHECK THAT AN IBA VALUE OF 01 AND 2 READS FROM THE CACHE
ONLY VALIDATE BYTES 6-0.
SUBTST 5 - CHECK THAT AN IBA VALUE OF 11 AND 3 READS FROM CACHE
VALIDATES THE ENTIRE BUFFER.

LOGIC DESCRIPTION
THIS TEST CHECKS THE VALID BIT GENERATION LOGIC ON THE IDP MODULE.

ERROR DESCRIPTION
DATA: EXPECTED MICRO PC BITS<7:0>
RECEIVED MICRO PC BITS<7:0>
BYTE LOOP COUNT -- SHOWS WHICH BYTE WAS BEING CHECK FOR VALIDITY:
7=BYTE 0, 6=BYTE 1, 5=BYTE 2, 4=BYTE 3, ETC.
VALID FLAG (SUBTEST 1 ONLY) -- IF SET, THE BYTE BEING CHECKED
SHOULD HAVE BEEN INVALID.
IBA BITS<1:0> LOOP COUNT (SUBTEST 1 ONLY) -- SHOWS WHAT VALUE
OF IBA BITS<1:0> ARE BEING TESTED:
4=00, 3=01, 2=10, AND 1=11
THE EXPECTED ADDRESS WILL EITHER BE 8F (FOR VALID DATA) OR
7E (FOR INVALID DATA).

SYNC POINT DESCRIPTION
ADDRESS SYNC20 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
WHEN 1 READ FROM CACHE IS REQUESTED, OR WHERE
THE SECOND LONG WORD FROM CACHE IS WRITTEN
INTO THE IB WHEN 2 READS FROM THE CACHE ARE REQUESTED.
ADDRESS SYNC21 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
WHEN 2 READS FROM THE CACHE ARE REQUESTED.

--
*****
=0
T119: NEWTST
D_K[.4]
R[0F] D+K[.1] ; 5 ARGUMENTS
R[1]_K[.14]

```



```

U 11DA, 0818,0039,0180,0800,0000,1349 :3247
U 11DB, 0001,003C,0180,0A90,0000,11DC :3248
U 11DC, 0818,0039,5D80,0800,0000,1348 :3249
U 11DD, 0001,003C,0180,0A98,0000,11DE :3250
:3251
:3252
:3253
:3254
:3255
:3256
:3257
:3258
U 11DE, 0000,003D,0180,0800,0000,134F :3259
U 11DF, 0018,0038,1180,09D0,0000,11E0 :3260
U 11E0, 0000,003D,0180,0800,0000,1335 :3261
U 11E1, 0018,0038,5D80,09E0,0000,13CE :3262
U 13CE, 0018,0038,7D80,0AA0,0000,13CF :3263
U 13CF, 0003,003C,0180,09D8,0000,11E2 :3264
U 11E2, 2000,003D,0180,0A08,4200,136B :3265
U 11E3, 0000,003C,0180,0A10,0000,13D0 :3266
U 13D0, 0800,003C,0180,09F0,0000,11E4 :3267
U 11E4, 0000,003D,0180,0800,0000,1363 :3268
U 11E5, 001D,A000,0180,0800,0010,13D1 :3269
U 13D1, 0810,0138,0180,0960,0000,11E6 :3270
U 11E6, 0001,A03D,0180,09E8,0000,1336 :3271
:3272
:3273
:3274
:3275
:3276
U 11E7, C019,8000,0580,09E0,0010,13D2 :3277
U 13D2, 0000,1B3C,0180,0958,0000,1007 :3278
U 1007, 0000,003C,0180,0800,0000,13D3 :3279
U 100F, 0810,0038,0180,0950,0000,13D8 :3280
U 13D3, 0010,8038,0180,0800,0010,13D4 :3281
U 13D4, 0800,013C,0180,0A20,0000,11E8 :3282
:3283
U 11E8, 0000,003C,0180,0A18,0000,13D0 :3284
U 11E9, 0819,0000,0580,0AA0,0000,13D5 :3285
U 13D5, 0000,003C,0180,0A08,0000,13D6 :3286
U 13D6, 001C,A000,0180,0800,0010,13D7 :3287
U 13D7, 0000,013C,0180,0800,0000,11EA :3288
U 11EA, 0000,003C,0180,0A10,0000,13D0 :3289
U 11EB, 0018,0038,0580,09D8,0000,11E8 :3290
U 13D8, 0019,8000,0580,09D0,0010,13D9 :3291
U 13D9, 0000,013C,0180,0A08,0000,11EC :3292
U 11EC, 0018,0014,0580,0A88,0000,11E1 :3293
:3294
:3295
:3296
:3297
:3298
:3299
:3300
U 11ED, 0000,003C,0180,0800,0000,11EE :3301

```

```

=0 D_K[.8],CALL,J/DCF ; GEN ADR OF VALID DATA
R[2]_D ; SAVE
=0 D_K[.7],CALL,J/DCE ; GENERATE THE ADR OF INVALID DATA
R[3]_D ; SAVE

:////////////////////
:
: IBA VALUES OF 0,1,2,3 AND ONE FETCH FROM MEMORY
:-

=0
T119S1: SUBTEST
RC[0A]_K[.4] ; SET THE IBA LOOP COUNT
=0 ERLOOP
T119L4: RC[0C]_K[.7] ; SET THE BYTE LOOP COUNT
R[4]_K[.18] ; SET CONST TO DETERMINE HOW MANY VALID BYTE
RC[0B]_0 ; SET THE VALID FLAG
=0 ALU_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE IB ONCE
LAB_R[2] ; GET ADR OF VALID DATA
T119L1: RC[0E]_LA,D,LA ; SAVE EXP ADDRESS
=0 CALL,J7DISPAT ; CHECK BYTE 0
ALU_Q-D,CLK.UBCC,BYTE ; ADR OK?
Z?,D,RC[0C] ; BRANCH IF YES
=0 ERROR1,RC[0D]_Q,BYTE

:
: THE FOLLOWING CODE CONTROLS THE LOOP FOR THIS SUBTEST
:-

RC[0C]_D-K[.1],CLK.UBCC,BYTE,IBC/CLR.0 ; DECREMENT BYTE LOOP COUNT
ALU_N?-LC,RC[0B] ; BRANCH IF CHECKED 8 BYTES
=0111 J/T119L20 ; SEE IF TIME TO CHANGE EXP ADR
D,RC[0A],J/T119L3
T119L20: ALU_LC,CLK.UBCC,BYTE ; IS VALID FLAG SET?
Z?,D,R[4] ; BRANCH IF YES
=0
T119L2: LAB_R[3],J/T119L1 ; KEEP CHECKING INVALID BYTES
R[4]_D-K[.1],D_ALU ; DECREMENT CONST FOR VALID CHECK
LAB_R[1] ; LATCH CURRENT IBA VALUE
ALU_LA[A-B]D,CLK.UBCC,BYTE ; ARE CONST AND IBA EQUAL YET?
Z? ; BRANCH IF TIME TO CHECK FOR INVALID BYTES
=0 LAB_R[2],J/T119L1 ; KEEP CHECKING FOR VALID BYTES
RC[0B]_K[.1],J/T119L2 ; CLEAR VALID FLAG AND START CHECKING FOR IN
T119L3: RC[0A]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT IBA LOOP COUNT
Z?,LAB_R[1] ; BRANCH IF DONE
=0 R[1]_LA+K[.1],J/T119L4 ; INCREMENT IBA AND CONTINUE

:////////////////////
:
: SET IBA=3 AND ALLOW TWO MEMORY READS
:-

NOP

```

U 11EE, 0000,003D,0180,0800,0000,134F :3302
U 11EF, 0818,0038,2180,0800,0000,13DA :3303
U 13DA, 0019,0014,0D80,0A88,0000,11F0 :3304
U 11F0, 0000,003D,0D80,0800,0084,7351 :3305
U 11F1, 0000,003C,0180,0800,0000,11F2 :3306
U 11F2, 0000,003D,0180,0800,0000,1335 :3307
U 11F3, 0018,0038,0180,09E0,0000,11F4 :3308
U 11F4, 2000,003D,0180,0A08,4200,136C :3309
U 11F5, 0000,003C,0180,0A10,0000,13DB :3310
U 13DB, 0800,003C,0180,09F0,0000,11F6 :3311
U 11F6, 0000,003D,0180,0800,0000,1363 :3312
U 11F7, 001D,A000,0180,0800,0010,13DC :3313
U 13DC, 0810,0138,0180,0960,0000,11F8 :3314
U 11F8, 0001,A03D,0180,09E8,0000,1336 :3315
U 11F9, 0819,8000,0580,09E0,0010,13DD :3316
U 13DD, C000,013C,0180,0800,0000,11FA :3317
U 11FA, 0019,8000,1180,0800,0010,13DE :3318
U 11FB, 0000,003C,0180,0800,0000,11FD :3319
U 13DE, 0000,1B3C,0180,0800,0000,1017 :3320
U 1017, 0000,003C,0180,0A10,0000,13DB :3321
U 101F, 0000,003C,0180,0A18,0000,13DB :3322

```
=0 SUBTEST
T119S2: D_K[.14]
R[1] D+K[.3] ; SET IBA = 3
=0 SETRC[F.3]
NOP
=0 ERLOOP
RC[0C] K[.8] ; SET THE BYTE LOOP COUNT
=0 ALU_R[T],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
LAB_R[2] ; GET ADR OF VALID DATA
T119L5: RC[0E] LA,D LA ; SAVE
=0 CALL,J7DISPAT ; CHECK BYTE 0
ALU Q-D,CLK.UBCC,BYTE ; ADR OK?
Z?,B RC[0C] ; BRANCH IF YES
=0 ERROR1,RC[0D] Q,BYTE
RC[0C] D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
Z?,IBC7CLR.0 ; BRANCH IF DONE
=0 ALU D-K[.4],CLK.UBCC,BYTE,J/T119L6 ; SEE IF TIME TO CHECK FOR INVALID BYTES
J/T119S3 ; GO TO NEXT SUB TEST
T119L6: ALU.N? ; BRANCH IF TIME FOR INVALID BYTES
=0111 LAB_R[2],J/T119L5 ; KEEP CHECKING VALID BYTES
LAB_R[3],J/T119L5 ; CHECK INVALID BYTES
```

;;

IBA=2 AND TWO MEMORY READS

```
=0 SUBTEST
T119S3: D_R[1]
R[1] D-K[.1] ; SET IBA EQUAL TO 2
=0 ERLOOP
RC[0C] K[.8] ; SET THE BYTE LOOP COUNT
=0 ALU_R[T],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
LAB_R[2] ; GET ADR OF VALID DATA
T119L7: RC[0E] LA,D LA ; SAVE
=0 CALL,J7DISPAT ; CHECK BYTE 0
ALU Q-D,CLK.UBCC,BYTE ; ADR OK?
Z?,B RC[0C] ; BRANCH IF YES
=0 ERROR1,RC[0D] Q,BYTE
RC[0C] D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
Z?,IBC7CLR.0 ; BRANCH IF DONE
=0 ALU D-K[.3],CLK.UBCC,BYTE,J/T119L8 ; SEE IF TIME TO CHECK FOR INVALID BYTES
J/T119S4 ; GO TO NEXT SUB TEST
T119L8: ALU.N? ; BRANCH IF TIME FOR INVALID BYTES
=0111 LAB_R[2],J/T119L7 ; KEEP CHECKING VALID BYTES
LAB_R[3],J/T119L7 ; CHECK INVALID BYTES
```

;;

IBA=1 AND TWO MEMORY READS

```
=0 SUBTEST
T119S4: D_R[1]
```

U 11FC, 0000,003D,0180,0800,0000,134F :3330
U 11FD, 0800,003C,0180,0A08,0000,13DF :3331
U 13DF, 0019,0000,0580,0A88,0000,11FE :3332
U 11FE, 0000,003D,0180,0800,0000,1335 :3333
U 11FF, 0018,0038,0180,09E0,0000,1300 :3334
U 1300, 2000,003D,0180,0A08,4200,136C :3335
U 1301, 0000,003C,0180,0A10,0000,13E0 :3336
U 13E0, 0800,003C,0180,09F0,0000,1302 :3337
U 1302, 0000,003D,0180,0800,0000,1363 :3338
U 1303, 001D,A000,0180,0800,0010,13E1 :3339
U 13E1, 0810,0138,0180,0960,0000,1304 :3340
U 1304, 0001,A03D,0180,09E8,0000,1336 :3341
U 1305, 0819,8000,0580,09E0,0010,13E2 :3342
U 13E2, C000,013C,0180,0800,0000,1306 :3343
U 1306, 0019,8000,0D80,0800,0010,13E3 :3344
U 1307, 0000,003C,0180,0800,0000,1309 :3345
U 13E3, 0000,1B3C,0180,0800,0000,1027 :3346
U 1027, 0000,003C,0180,0A10,0000,13E0 :3347
U 102F, 0000,003C,0180,0A18,0000,13E0 :3348

U 1308, 0000,003D,0180,0800,0000,134F :3355
U 1309, 0800,003C,0180,0A08,0000,13E4 :3356

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U 13E4, 0019,0000,0580,0A88,0000,130A :3357
:3358
:3359
U 130A, 0000,003D,0180,0800,0000,1335 :3360
U 130B, 0018,0038,0180,09E0,0000,130C :3361
U 130C, 2000,003D,0180,0A08,4200,136C :3362
U 130D, 0000,003C,0180,0A10,0000,13E5 :3363
U 13E5, 0800,003C,0180,09F0,0000,130E :3364
U 130E, 0000,003D,0180,0800,0000,1363 :3365
U 130F, 001D,A000,0180,0800,0010,13E6 :3366
U 13E6, 0810,0138,0180,0960,0000,1310 :3367
U 1310, 0001,A03D,0180,09E8,0000,1336 :3368
U 1311, 0819,8000,0580,09E0,0010,13E7 :3369
U 13E7, C000,013C,0180,0800,0000,1312 :3370
U 1312, 0019,8000,0980,0800,0010,13E8 :3371
U 1313, 0000,003C,0180,0800,0000,1315 :3372
U 13E8, 0000,1B3C,0180,0800,0000,1037 :3373
U 1037, 0000,003C,0180,0A10,0000,13E5 :3374
U 103F, 0000,003C,0180,0A18,0000,13E5 :3375
:3376
:3377
:3378
:3379
:3380
:3381
:3382
U 1314, 0000,003D,0180,0800,0000,134F :3383
U 1315, 0800,003C,0180,0A08,0000,13E9 :3384
U 13E9, 0019,0014,0980,0A88,0000,1316 :3385
:3386
:3387
U 1316, 0000,003D,0180,0800,0000,1335 :3388
U 1317, 0018,0038,0180,09E0,0000,1318 :3389
U 1318, 2000,003D,0180,0A08,4200,1364 :3390
U 1319, 0000,003C,0180,0A10,0000,13EA :3391
U 13EA, 0800,003C,0180,09F0,0000,131A :3392
U 131A, 0000,003D,0180,0800,0000,1363 :3393
U 131B, 001D,A000,0180,0800,0010,13EB :3394
U 13EB, 0810,0138,0180,0960,0000,131C :3395
U 131C, 0001,A03D,0180,09E8,0000,1336 :3396
U 131D, 0819,8000,0580,09E0,0010,13EC :3397
U 13EC, C000,013C,0180,0800,0000,131E :3398
U 131E, 0000,003C,0180,0A10,0000,13EA :3399
U 131F, 0000,003C,0180,0800,0000,13ED :3400
:3401
:3402
U 13ED, 0000,003C,0180,0800,0000,1320 :3403
:3404
:3405
:3406
:3407
:3408
:3409
:3410
:3411

```

```

R[1],D-K[.1] ; SET IBA EQUAL TO 1

=0 ERLOOP
RC[0C] K[.8] ; SET THE BYTE LOOP COUNT
ALU_R[1],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
LAB_R[2] ; GET ADR OF VALID DATA
T119L9: RC[0E] LA,D LA ; SAVE
=0 CALL,J7DISPAT ; CHECK BYTE 0
ALU Q-D,CLK.UBCC,BYTE ; ADR OK?
Z?,B RC[0C] ; BRANCH IF YES
=0 ERROR1,RC[0D] Q,BYTE
RC[0C] D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
Z?,IBC7CLR.0 ; BRANCH IF DONE
=0 ALU D-K[.2],CLK.UBCC,BYTE,J/T119L10 ; SEE IF TIME TO CHECK FOR INVALID BYTES
J/T119S5 ; GO TO NEXT SUB TEST
T119L10: ALU.N? ; BRANCH IF TIME FOR INVALID BYTES
=0111 LAB_R[2],J/T119L9 ; KEEP CHECKING VALID BYTES
LAB_R[3],J/T119L9 ; CHECK INVALID BYTES

:////////////////////
:
: IBA=3 AND THREE MEMORY REFERENCES
:-
=0 SUBTEST
T119S5: D R[1]
R[1],D+K[.2] ; SET IBA EQUAL TO 3

=0 ERLOOP
RC[0C] K[.8] ; SET THE BYTE LOOP COUNT
ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
LAB_R[2] ; GET ADR OF VALID DATA
T119L11: RC[0E] LA,D LA ; SAVE
=0 CALL,J7DISPAT ; CHECK BYTE 0
ALU Q-D,CLK.UBCC,BYTE ; ADR OK?
Z?,B RC[0C] ; BRANCH IF YES
=0 ERROR1,RC[0D] Q,BYTE
RC[0C] D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
Z?,IBC7CLR.0 ; BRANCH IF DONE
=0 LAB_R[2],J/T119L11 ; CONTINUE TESTING
NOP

NOP

: THE FOLLOWING DATA IS USED IN THE ABOVE TEST:
:Z 14
:$ 0000,0000,0000,0000,0000,0000

```

ZZ-ESKAH-V132 TEST 119 VALID BIT GENERATION
ESKAH34.MCR MICRO2 1M(01)

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J 3

SEQ 0855
Page 7

		:3412		
		:3413		
		:3414	=0	
U 1320,	0000,003D,0180,0800,0000,105F	:3415	T11A:	NEWTST
U 1321,	0000,003C,0180,0800,0000,1322	:3416		NOP
		:3417	=0	
U 1322,	0000,003D,0180,0800,0000,105F	:3418	T11B:	NEWTST
U 1323,	0000,003C,0180,0800,0000,13EE	:3419		NOP
U 13EE,	0000,003D,0180,0800,0000,105F	:3420	ENDTST:	NEWTST

22-ESKAH-V132 Line Number Index

ESKAH34.MCR

MICRO2 1M(01) 16-DEC-82 12:09:00
Location / Line Number Index

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1876=	1845	1847=	1866=	1867=	1868=	1846	3279=
U 1008	1884=	1885=	2426=	2427=	2429=	2430=	1869	3280=
U 1010	2431=	2432=	2440=	2441=	2442=	2443=	1870	3321=
U 1018	2445=	2446=	2447=	2448=	2450=	2451=	1871	3322=
U 1020	2453=	2454=	2455=	2456=	2458=	2466=	1872	3347=
U 1028	2467=	2468=	2470=	2471=	2474=	2475=	1873	3348=
U 1030	2476=	2477=	2479=	2480=	2482=	2483=	1874	3374=
U 1038	2484=	2485=	2487=	2495=	2496=	2497=	1875	3375=
U 1040	2499=	2500=	2503=	2504=	2505=	2506=	2508=	2509=
U 1048	2511=	2512=	2513=	2514=	2516=	2524=	1920=	1882
U 1050	2525=	2526=	2527=	2528=	2531=	2532=	2533=	2534=
U 1058	2535=	2536=	1924=	1883	2538=	2539=	1928=	1897
U 1060	2540=	2541=	2543=	2551=	2552=	2553=	2555=	2556=
U 1068	2559=	2560=	2561=	2562=	2563=	2564=	2566=	2567=
U 1070	2568=	2569=	2571=	2579=	2580=	2581=	2583=	2584=
U 1078	2587=	2588=	2589=	2590=	2591=	2592=	2594=	2595=
U 1080	2596=	2597=	2599=	2607=	2608=	2609=	2611=	2612=
U 1088	2616=	2617=	2618=	2619=	2620=	2621=	2623=	2624=
U 1090	2625=	2626=	2628=	2636=	2637=	2638=	2639=	2640=
U 1098	2643=	2644=	2645=	2646=	2647=	2648=	2650=	2651=
U 10A0	2652=	2653=	2655=	2663=	2664=	2665=	2667=	2668=
U 10A8	2671=	2672=	2673=	2674=	2676=	2677=	2679=	2680=
U 10B0	2681=	2682=	2684=	2692=	2693=	2694=	2696=	2697=
U 10B8	2700=	2701=	2702=	2703=	2704=	2705=	2707=	2708=
U 10C0	2709=	2710=	2712=	2720=	2721=	2722=	2724=	2725=
U 10C8	2728=	2729=	2730=	2731=	2732=	2733=	2735=	2736=
U 10D0	2737=	2738=	2740=	2748=	2749=	2750=	2751=	2752=
U 10D8	2755=	2756=	2757=	2758=	2760=	2761=	2763=	2764=
U 10E0	2765=	2766=	2768=	2776=	2777=	2778=	2780=	2781=
U 10E8	2784=	2785=	2786=	2787=	2789=	2790=	2792=	2793=
U 10F0	2794=	2795=	2797=	2805=	2806=	2807=	2809=	2810=
U 10F8	2813=	2814=	2815=	2816=	2818=	2819=	2821=	2822=
U 1100	1831=	1832=	1833=	1834=	1835=	1836=	1837=	1838=
U 1108	1839=	1898	2823=	2824=	1840=	1841=	1842=	1843=
U 1110	2826=	2834=	2835=	2836=	2838=	2839=	2842=	2843=
U 1118	2844=	2845=	2847=	2848=	2850=	2851=	2852=	2853=
U 1120	2855=	2863=	2864=	2865=	2866=	2867=	2870=	2871=
U 1128	2872=	2873=	2874=	2875=	2877=	2878=	2879=	2880=
U 1130	2882=	2890=	2891=	2892=	2894=	2895=	2898=	2899=
U 1138	2900=	2901=	2904=	2905=	2907=	2908=	2909=	2910=
U 1140	2912=	2920=	2921=	2922=	2924=	2925=	2928=	2929=
U 1148	2930=	2931=	2932=	2933=	2935=	2936=	2937=	2938=
U 1150	2940=	2948=	2949=	2950=	1899	2010=	2952=	2953=
U 1158	2955=	2956=	2959=	2960=	2961=	2962=	2963=	2964=
U 1160	2966=	2967=	2968=	2969=	2971=	2972=	2981=	2982=
U 1168	2983=	2984=	2986=	2987=	2990=	2991=	2992=	2993=
U 1170	2995=	2996=	2998=	2999=	3000=	3001=	3003=	3011=
U 1178	3012=	3013=	3015=	3016=	3019=	3020=	3021=	3022=
U 1180	3024=	3025=	3027=	3028=	3029=	3030=	3032=	3040=
U 1188	3041=	3042=	3044=	3045=	3048=	3049=	3050=	3051=
U 1190	3053=	3054=	3056=	3057=	3058=	3059=	3061=	3069=
U 1198	3070=	3071=	3075=	3076=	3079=	3080=	3081=	3082=

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3084=	3085=	3087=	3088=	3089=	3090=	3092=	3100=
U 11A8	3101=	3102=	3104=	3105=	3108=	3109=	3110=	3111=
U 11B0	3113=	3114=	3116=	3117=	3118=	3119=	3121=	3129=
U 11B8	3130=	3131=	3133=	3134=	3137=	3138=	3139=	3140=
U 11C0	3143=	3144=	3146=	3147=	3148=	3149=	3151=	3159=
U 11C8	3160=	3161=	3165=	3166=	3169=	3170=	3171=	3172=
U 11D0	3174=	3175=	3177=	3178=	3179=	3180=	3182=	3183=
U 11D8	3243=	3244=	3247=	3248=	3249=	3250=	3259=	3260=
U 11E0	3261=	3262=	3265=	3266=	3268=	3269=	3271=	3277=
U 11E8	3284=	3285=	3289=	3290=	3293=	3301=	3302=	3303=
U 11F0	3305=	3306=	3307=	3308=	3309=	3310=	3312=	3313=
U 11F8	3315=	3316=	3318=	3319=	3330=	3331=	3333=	3334=
U 1200	2053:	2054:	2055:	2056:	2057:	2058:	2059:	2060:
U 1208	2061:	2062:	2063:	2064:	2065:	2066:	2067:	2068:
U 1210	2069:	2070:	2071:	2072:	2073:	2074:	2075:	2076:
U 1218	2077:	2078:	2079:	2080:	2081:	2082:	2083:	2084:
U 1220	2085:	2086:	2087:	2088:	2089:	2090:	2091:	2092:
U 1228	2093:	2094:	2095:	2096:	2097:	2098:	2099:	2100:
U 1230	2101:	2102:	2103:	2104:	2105:	2106:	2107:	2108:
U 1238	2109:	2110:	2111:	2112:	2113:	2114:	2115:	2116:
U 1240	2117:	2118:	2119:	2120:	2121:	2122:	2123:	2124:
U 1248	2125:	2126:	2127:	2128:	2129:	2130:	2131:	2132:
U 1250	2133:	2134:	2135:	2136:	2137:	2138:	2139:	2140:
U 1258	2141:	2142:	2143:	2144:	2145:	2146:	2147:	2148:
U 1260	2149:	2150:	2151:	2152:	2153:	2154:	2155:	2156:
U 1268	2157:	2158:	2159:	2160:	2161:	2162:	2163:	2164:
U 1270	2165:	2166:	2167:	2168:	2169:	2170:	2171:	2172:
U 1278	2173:	2174:	2175:	2176:	2177:	2178:	2179:	2180:
U 1280	2181:	2182:	2183:	2184:	2185:	2186:	2187:	2188:
U 1288	2189:	2190:	2191:	2192:	2193:	2194:	2195:	2196:
U 1290	2197:	2198:	2199:	2200:	2201:	2202:	2203:	2204:
U 1298	2205:	2206:	2207:	2208:	2209:	2210:	2211:	2212:
U 12A0	2213:	2214:	2215:	2216:	2217:	2218:	2219:	2220:
U 12A8	2221:	2222:	2223:	2224:	2225:	2226:	2227:	2228:
U 12B0	2229:	2230:	2231:	2232:	2233:	2234:	2235:	2236:
U 12B8	2237:	2238:	2239:	2240:	2241:	2242:	2243:	2244:
U 12C0	2245:	2246:	2247:	2248:	2249:	2250:	2251:	2252:
U 12C8	2253:	2254:	2255:	2256:	2257:	2258:	2259:	2260:
U 12D0	2261:	2262:	2263:	2264:	2265:	2266:	2267:	2268:
U 12D8	2269:	2270:	2271:	2272:	2273:	2274:	2275:	2276:
U 12E0	2277:	2278:	2279:	2280:	2281:	2282:	2283:	2284:
U 12E8	2285:	2286:	2287:	2288:	2289:	2290:	2291:	2292:
U 12F0	2293:	2294:	2295:	2296:	2297:	2298:	2299:	2300:
U 12F8	2301:	2302:	2303:	2304:	2305:	2306:	2307:	2308:
U 1300	3335=	3336=	3338=	3339=	3341=	3342=	3344=	3345=
U 1308	3355=	3356=	3360=	3361=	3362=	3363=	3365=	3366=
U 1310	3368=	3369=	3371=	3372=	3383=	3384=	3388=	3389=
U 1318	3390=	3391=	3393=	3394=	3396=	3397=	3399=	3400=
U 1320	3415=	3416=	3418=	3419=	1900	1901	1902	1903
U 1328	1904	1905	1906	1907	1908	1909	1910	1911
U 1330	1912	1913	1914	1915	1916	1917	1918	1919
U 1338	1922	1923	1966	1967	1968	1969	1970	1971
U 1340	1972	1973	1974	1975	1976	1977	1978	1979

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	1980	1981	1983	1984	1985	1986	1988	1998
U 1350	1999	2007	2008	2009	2018	2019	2021	2022
U 1358	2023	2024	2027	2028	2029	2030	2031	2032
U 1360	2033	2034	2035	2048	2316	2317	2318	2320
U 1368	2321	2323	2324	2332	2341	2428	2452	2457
U 1370	2469	2481	2486	2498	2510	2515	2537	2542
U 1378	2554	2565	2570	2582	2593	2598	2610	2613
U 1380	2622	2627	2649	2654	2666	2675	2678	2683
U 1388	2695	2706	2711	2723	2734	2739	2759	2762
U 1390	2767	2779	2788	2791	2796	2808	2817	2820
U 1398	2825	2837	2846	2849	2854	2876	2881	2893
U 13A0	2902	2903	2906	2911	2923	2934	2939	2951
U 13A8	2954	2965	2970	2985	2994	2997	3002	3014
U 13B0	3023	3026	3031	3043	3052	3055	3060	3072
U 13B8	3073	3074	3083	3086	3091	3103	3112	3115
U 13C0	3120	3132	3141	3142	3145	3150	3162	3163
U 13C8	3164	3173	3176	3181	3245	3246	3263	3264
U 13D0	3267	3270	3278	3281	3282	3286	3287	3288
U 13D8	3291	3292	3304	3311	3314	3317	3320	3332
U 13E0	3337	3340	3343	3346	3357	3364	3367	3370
U 13E8	3373	3385	3392	3395	3398	3403	3420	
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

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	Words not
	in bounds
ESKOODEF	0
ESKOO MAC	0
ESKAHMAC	0
ESKAH34	1023

Used 1023
 Remaining

Total microwords used in memory U: 1023
 Total microwords remaining in memory U: 0
 Highest address used in memory U: 13FF (hex)

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ESKAH34.MCR

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SEQ 0860
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; The files used in this assembly are:

ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH34.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

CCCC
CCCC
CCCC

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2306	TEST 11C VALID BIT GENERATION (CONTINUED)
: 2398	TEST 11D STALL CONTROL LOGIC
: 2637	TEST 11E 'A FORK' OP CODE DECODE
: 2796	TEST 11F 'A FORK' BRANCH OPCODES DECODE
: 3028	TEST 120 SELECT SPECIFIER LOGIC
: 3222	TEST 121 'B FORK' OPCODE DECODES
: 3364	TEST 122 'C FORK' OPCODE DECODES
: 3523	TEST 123 D MUX SELECT AND DATA INTEGRITY
: 3870	TEST 124 BDEST AND 16 BIT BDEST DECODE

ZZ-ESKAH-V132 Subroutines
ESKAH35.MCR

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D 4

SEQ 0862
Page

:1
:1804
:1805

:NOLIST
:LIST

CCCCC

```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
:1825
:1826
:1827
:1828
:1829
:1830
U 1100, 0000,003C,19C0,0A78,0084,7001
U 1101, 0000,003C,05C0,0A78,0084,7001
U 1102, 0000,003C,09C0,0A78,0084,7001
U 1103, 0000,003C,0DC0,0A78,0084,7001
U 1104, 0000,003C,11C0,0A78,0084,7001
U 1105, 0000,003C,D5C0,0A78,0084,7001
U 1106, 0000,003C,D9C0,0A78,0084,7001
U 1107, 0000,003C,5DC0,0A78,0084,7001
U 1108, 0000,003C,01C0,0A78,0084,7001
U 110C, 0000,003C,85C0,0A78,0084,7001
U 110D, 0000,003C,89C0,0A78,0084,7001
U 110E, 0000,003C,65C0,0A78,0084,7001
U 110F, 0000,003C,61C0,0A78,0084,718F
:1844
U 1001, 0001,2024,0180,0800,0010,104F
U 104F, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

```

.REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
 EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

```

1100: SC_K[ZERO],Q_R[OF],J/TRPH0      : SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0      : DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0      : X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0      : TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0      : TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0      : TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0      : RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0      : TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0      : CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0      : RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0      : TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0     : ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2      : CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC    : WAS TRAP EXPECTED?
      Z?                               : BRANCH IF NO
=0    ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 : CLEAR THE BIT AND RETURN

```

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER

```



```

:1861 :          CACHE PARITY REGISTER
:1862 :          TB ERROR REGISTER 1
:1863 :          TB ERROR REGISTER 0
:1864 :-
:1865
U 1003, 0018,0038,1D80,09E8,0000,1004 :1866 TRPH1: RC[0D],SC
U 1004, 0000,003D,D980,0800,0084,71C1 :1867 =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B :1868      Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F :1869      RC[6],Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109 :1870      RC[7],Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1154 :1871      RC[0B],Q,Q_ID[FAULT]
U 1154, 0001,203C,75F0,2DE0,0000,118C :1872      RC[0C],Q,Q_ID[MAINT]
U 118C, 0001,203C,79F0,2DC8,0000,118D :1873      RC[9],Q,Q_ID[PARITY]
U 118D, 0001,203C,69F0,2DC0,0000,118E :1874      RC[8],Q,Q_ID[TIME.ADDR]
U 118E, 0001,203C,81F0,2DD0,0000,1000 :1875      RC[0A],Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11A6 :1876 1000: RC[0E],Q,ERROR1
:1877
:1878 :+
:1879 : THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
:1880 :-
:1881
U 118F, 0001,2024,0180,0800,0010,1190 :1882 TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 1190, 0000,013C,0180,0800,0000,1006 :1883      Z?                                ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001 :1884 =0      ALU Q[AND]MASK,RC[0F],ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003 :1885      J/TRPH1                          ; REPORT UNEXPECTED TRAP
:1886
:1887
:1888 :+
:1889 : THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
:1890 : MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
:1891 :          NEWTST
:1892 :          ERLOOP
:1893 :          ERROR1
:1894 :          ERROR2
:1895
:1896
U 1191, 0000,003C,65F8,0800,0084,7192 :1897 SCOPE: SC_KC[10],Q_0      ; SETUP TO WRITE IPL OF 1F
U 1192, 0818,0038,8D80,0800,0000,1193 :1898      D_RC[1F]            ; ...
U 1193, 0D0C,003C,0180,0800,0000,1194 :1899      D-DAL.SC
U 1194, 0000,003C,3D80,3C00,0000,1195 :1900      ID[PSL],D          ; WRITE THE PSL
U 1195, 0818,0038,0580,0800,0000,1196 :1901      D_KC[1]           ; SETUP TO CLEAR THE CES REGISTER
U 1196, 0D00,003C,0180,0800,0000,1197 :1902      D-DAL.SC
U 1197, 0F00,003C,3180,3C00,0000,1198 :1903      ID[CES],D,D_0      ; CLEAR THE CES REGISTER
U 1198, 0000,003C,5D80,3C00,0000,1199 :1904      ID[ACC.[S]],D      ; SHUT OFF THE FLOATING POINT
U 1199, 0000,003C,3980,3C00,0000,119A :1905      ID[SIR],D          ; CLEAR THE SIR REGISTER
U 119A, 0000,003C,2980,3C00,0000,119B :1906      ID[CLK.[S]],D      ; STOP INTERVAL TIMER
U 119B, 0000,003C,4980,3C00,0000,119C :1907      ID[TBER0],D        ; SHUT OFF THE TB
U 119C, 0000,003C,7180,3C00,0000,119D :1908      ID[COMP],D         ; CLEAR SILO COMPARATOR
U 119D, 0818,0038,C180,0800,0000,119E :1909      D_KC[FFFF]
U 119E, 0000,003C,6580,3C00,0000,119F :1910      ID[SBI.ERR],D
U 119F, 0F00,003C,6D80,3C00,0000,11A0 :1911      ID[FAULT],D,D_0
U 11A0, 0000,003C,6D80,3C00,0000,11A1 :1912      ID[FAULT],D
U 11A1, 0000,003C,6580,3C00,0000,11A2 :1913      ID[SBI.ERR],D
U 11A2, 0003,003C,0180,09F0,0000,11A3 :1914      RC[0E],0
U 11A3, 0003,003C,0180,0AF8,0000,11A4 :1915      RC[0F],0
```

```

U 11A4, 0003,003C,0180,09E8,0000,105E :1916
U 11A5, 0818,0038,0980,0800,0000,105E :1917
U 11A6, 0810,0038,0180,0978,0000,11A7 :1918
U 11A7, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 11A8, 0810,0038,0180,0978,0000,11A9 :1922
U 11A9, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
:1927
U 105E, 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,11AA :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 11AA, 0018,0038,1980,0800,0000,11BA :1966
U 11AB, 0018,0038,1980,0800,0000,11BB :1967
U 11AC, 0018,0038,1980,0800,0000,11BC :1968
U 11AD, 0018,0038,1980,0800,0000,11BD :1969
U 11AE, 0018,0038,0980,0800,0000,11BA :1970

```

```

RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE

;+
; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
;-

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

;+
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
; FOR EXAMPLE: IF A HEX '55' IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
; THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
;
; =0 D 0,CALL,J/DC5
; NOP
; =0 CALL,J/DC5
;-

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```

```
U 11AF, 0018,0038,0980,0800,0000,11BB :1971
U 11B0, 0018,0038,0980,0800,0000,11BC :1972
U 11B1, 0018,0038,0980,0800,0000,11BD :1973
U 11B2, 0018,0038,0580,0800,0000,11BA :1974
U 11B3, 0018,0038,0580,0800,0000,11BB :1975
U 11B4, 0018,0038,0580,0800,0000,11BC :1976
U 11B5, 0018,0038,0580,0800,0000,11BD :1977
U 11B6, 0018,0038,C180,0800,0000,11BA :1978
U 11B7, 0018,0038,C180,0800,0000,11BB :1979
U 11B8, 0018,0038,C180,0800,0000,11BC :1980
U 11B9, 0018,0038,C180,0800,0000,11BD :1981
:1982
U 11BA, 0118,0038,1880,0800,0000,11BE :1983
U 11BB, 0118,0038,0880,0800,0000,11BE :1984
U 11BC, 0118,0038,0780,0800,0000,11BE :1985
U 11BD, 0118,0038,C380,0800,0000,11BE :1986
:1987
U 11BE, 0100,003E,0380,0800,0000,0001 :1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
U 11BF, 0810,0038,4D80,0978,0000,11C0 :1998
U 11C0, 0019,4016,4D80,09F8,0000,0001 :1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
U 11C1, 0010,0038,01C0,0978,0000,11C2 :2007
U 11C2, 0019,2034,4DC0,0800,0000,11C3 :2008
U 11C3, 0019,2032,1D80,09F8,0000,0001 :2009
:2010
```

```
DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT

;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-

SUBTST: D_RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1

;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-

SETRCF: Q_RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1
```

```

:2011
U 1155, 0019,2000,05C0,0800,0000,12AB :2012
:2013
:2014
:2015
:2016
:2017
:2018
:2019
:2020
:2021
:2022
U 11C4, 0038,003B,41C0,0800,0000,1200 :2023
:2024
:2025
:2026
:2027
U 1200, 0019,2000,05C0,0800,0000,1201 :2028
U 1201, 0019,2000,05C0,0800,0000,1202 :2029
U 1202, 0019,2000,05C0,0800,0000,1203 :2030
U 1203, 0019,2000,05C0,0800,0000,1204 :2031
U 1204, 0019,2000,05C0,0800,0000,1205 :2032
U 1205, 0019,2000,05C0,0800,0000,1206 :2033
U 1206, 0019,2000,05C0,0800,0000,1207 :2034
U 1207, 0019,2000,05C0,0800,0000,1208 :2035
U 1208, 0019,2000,05C0,0800,0000,1209 :2036
U 1209, 0019,2000,05C0,0800,0000,120A :2037
U 120A, 0019,2000,05C0,0800,0000,120B :2038
U 120B, 0019,2000,05C0,0800,0000,120C :2039
U 120C, 0019,2000,05C0,0800,0000,120D :2040
U 120D, 0019,2000,05C0,0800,0000,120E :2041
U 120E, 0019,2000,05C0,0800,0000,120F :2042
U 120F, 0019,2000,05C0,0800,0000,1210 :2043
U 1210, 0019,2000,05C0,0800,0000,1211 :2044
U 1211, 0019,2000,05C0,0800,0000,1212 :2045
U 1212, 0019,2000,05C0,0800,0000,1213 :2046
U 1213, 0019,2000,05C0,0800,0000,1214 :2047
U 1214, 0019,2000,05C0,0800,0000,1215 :2048
U 1215, 0019,2000,05C0,0800,0000,1216 :2049
U 1216, 0019,2000,05C0,0800,0000,1217 :2050
U 1217, 0019,2000,05C0,0800,0000,1218 :2051
U 1218, 0019,2000,05C0,0800,0000,1219 :2052
U 1219, 0019,2000,05C0,0800,0000,121A :2053
U 121A, 0019,2000,05C0,0800,0000,121B :2054
U 121B, 0019,2000,05C0,0800,0000,121C :2055
U 121C, 0019,2000,05C0,0800,0000,121D :2056
U 121D, 0019,2000,05C0,0800,0000,121E :2057
U 121E, 0019,2000,05C0,0800,0000,121F :2058
U 121F, 0019,2000,05C0,0800,0000,1220 :2059
U 1220, 0019,2000,05C0,0800,0000,1221 :2060
U 1221, 0019,2000,05C0,0800,0000,1222 :2061
U 1222, 0019,2000,05C0,0800,0000,1223 :2062
U 1223, 0019,2000,05C0,0800,0000,1224 :2063
U 1224, 0019,2000,05C0,0800,0000,1225 :2064
U 1225, 0019,2000,05C0,0800,0000,1226 :2065

```

1155: Q_Q-K[.1],J/12AB

THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.

SYNCOO:

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL

1200:

DISPATTBL:

```

1200: Q_Q-K[.1]
1201: Q_Q-K[.1]
1202: Q_Q-K[.1]
1203: Q_Q-K[.1]
1204: Q_Q-K[.1]
1205: Q_Q-K[.1]
1206: Q_Q-K[.1]
1207: Q_Q-K[.1]
1208: Q_Q-K[.1]
1209: Q_Q-K[.1]
120A: Q_Q-K[.1]
120B: Q_Q-K[.1]
120C: Q_Q-K[.1]
120D: Q_Q-K[.1]
120E: Q_Q-K[.1]
120F: Q_Q-K[.1]
1210: Q_Q-K[.1]
1211: Q_Q-K[.1]
1212: Q_Q-K[.1]
1213: Q_Q-K[.1]
1214: Q_Q-K[.1]
1215: Q_Q-K[.1]
1216: Q_Q-K[.1]
1217: Q_Q-K[.1]
1218: Q_Q-K[.1]
1219: Q_Q-K[.1]
121A: Q_Q-K[.1]
121B: Q_Q-K[.1]
121C: Q_Q-K[.1]
121D: Q_Q-K[.1]
121E: Q_Q-K[.1]
121F: Q_Q-K[.1]
1220: Q_Q-K[.1]
1221: Q_Q-K[.1]
1222: Q_Q-K[.1]
1223: Q_Q-K[.1]
1224: Q_Q-K[.1]
1225: Q_Q-K[.1]

```


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SEQ 0868
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U 1226.	0019,2000,05C0,0800,0000,1227	:2066	1226:	Q-Q-K[.1]
U 1227.	0019,2000,05C0,0800,0000,1228	:2067	1227:	Q-Q-K[.1]
U 1228.	0019,2000,05C0,0800,0000,1229	:2068	1228:	Q-Q-K[.1]
U 1229.	0019,2000,05C0,0800,0000,122A	:2069	1229:	Q-Q-K[.1]
U 122A.	0019,2000,05C0,0800,0000,122B	:2070	122A:	Q-Q-K[.1]
U 122B.	0019,2000,05C0,0800,0000,122C	:2071	122B:	Q-Q-K[.1]
U 122C.	0019,2000,05C0,0800,0000,122D	:2072	122C:	Q-Q-K[.1]
U 122D.	0019,2000,05C0,0800,0000,122E	:2073	122D:	Q-Q-K[.1]
U 122E.	0019,2000,05C0,0800,0000,122F	:2074	122E:	Q-Q-K[.1]
U 122F.	0019,2000,05C0,0800,0000,1230	:2075	122F:	Q-Q-K[.1]
U 1230.	0019,2000,05C0,0800,0000,1231	:2076	1230:	Q-Q-K[.1]
U 1231.	0019,2000,05C0,0800,0000,1232	:2077	1231:	Q-Q-K[.1]
U 1232.	0019,2000,05C0,0800,0000,1233	:2078	1232:	Q-Q-K[.1]
U 1233.	0019,2000,05C0,0800,0000,1234	:2079	1233:	Q-Q-K[.1]
U 1234.	0019,2000,05C0,0800,0000,1235	:2080	1234:	Q-Q-K[.1]
U 1235.	0019,2000,05C0,0800,0000,1236	:2081	1235:	Q-Q-K[.1]
U 1236.	0019,2000,05C0,0800,0000,1237	:2082	1236:	Q-Q-K[.1]
U 1237.	0019,2000,05C0,0800,0000,1238	:2083	1237:	Q-Q-K[.1]
U 1238.	0019,2000,05C0,0800,0000,1239	:2084	1238:	Q-Q-K[.1]
U 1239.	0019,2000,05C0,0800,0000,123A	:2085	1239:	Q-Q-K[.1]
U 123A.	0019,2000,05C0,0800,0000,123B	:2086	123A:	Q-Q-K[.1]
U 123B.	0019,2000,05C0,0800,0000,123C	:2087	123B:	Q-Q-K[.1]
U 123C.	0019,2000,05C0,0800,0000,123D	:2088	123C:	Q-Q-K[.1]
U 123D.	0019,2000,05C0,0800,0000,123E	:2089	123D:	Q-Q-K[.1]
U 123E.	0019,2000,05C0,0800,0000,123F	:2090	123E:	Q-Q-K[.1]
U 123F.	0019,2000,05C0,0800,0000,1240	:2091	123F:	Q-Q-K[.1]
U 1240.	0019,2000,05C0,0800,0000,1241	:2092	1240:	Q-Q-K[.1]
U 1241.	0019,2000,05C0,0800,0000,1242	:2093	1241:	Q-Q-K[.1]
U 1242.	0019,2000,05C0,0800,0000,1243	:2094	1242:	Q-Q-K[.1]
U 1243.	0019,2000,05C0,0800,0000,1244	:2095	1243:	Q-Q-K[.1]
U 1244.	0019,2000,05C0,0800,0000,1245	:2096	1244:	Q-Q-K[.1]
U 1245.	0019,2000,05C0,0800,0000,1246	:2097	1245:	Q-Q-K[.1]
U 1246.	0019,2000,05C0,0800,0000,1247	:2098	1246:	Q-Q-K[.1]
U 1247.	0019,2000,05C0,0800,0000,1248	:2099	1247:	Q-Q-K[.1]
U 1248.	0019,2000,05C0,0800,0000,1249	:2100	1248:	Q-Q-K[.1]
U 1249.	0019,2000,05C0,0800,0000,124A	:2101	1249:	Q-Q-K[.1]
U 124A.	0019,2000,05C0,0800,0000,124B	:2102	124A:	Q-Q-K[.1]
U 124B.	0019,2000,05C0,0800,0000,124C	:2103	124B:	Q-Q-K[.1]
U 124C.	0019,2000,05C0,0800,0000,124D	:2104	124C:	Q-Q-K[.1]
U 124D.	0019,2000,05C0,0800,0000,124E	:2105	124D:	Q-Q-K[.1]
U 124E.	0019,2000,05C0,0800,0000,124F	:2106	124E:	Q-Q-K[.1]
U 124F.	0019,2000,05C0,0800,0000,1250	:2107	124F:	Q-Q-K[.1]
U 1250.	0019,2000,05C0,0800,0000,1251	:2108	1250:	Q-Q-K[.1]
U 1251.	0019,2000,05C0,0800,0000,1252	:2109	1251:	Q-Q-K[.1]
U 1252.	0019,2000,05C0,0800,0000,1253	:2110	1252:	Q-Q-K[.1]
U 1253.	0019,2000,05C0,0800,0000,1254	:2111	1253:	Q-Q-K[.1]
U 1254.	0019,2000,05C0,0800,0000,1255	:2112	1254:	Q-Q-K[.1]
U 1255.	0019,2000,05C0,0800,0000,1256	:2113	1255:	Q-Q-K[.1]
U 1256.	0019,2000,05C0,0800,0000,1257	:2114	1256:	Q-Q-K[.1]
U 1257.	0019,2000,05C0,0800,0000,1258	:2115	1257:	Q-Q-K[.1]
U 1258.	0019,2000,05C0,0800,0000,1259	:2116	1258:	Q-Q-K[.1]
U 1259.	0019,2000,05C0,0800,0000,125A	:2117	1259:	Q-Q-K[.1]
U 125A.	0019,2000,05C0,0800,0000,125B	:2118	125A:	Q-Q-K[.1]
U 125B.	0019,2000,05C0,0800,0000,125C	:2119	125B:	Q-Q-K[.1]
U 125C.	0019,2000,05C0,0800,0000,125D	:2120	125C:	Q-Q-K[.1]

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U 125D.	0019.2000.05C0.0800.0000.125E	:2121	125D:	Q-Q-K[.1]
U 125E.	0019.2000.05C0.0800.0000.125F	:2122	125E:	Q-Q-K[.1]
U 125F.	0019.2000.05C0.0800.0000.1260	:2123	125F:	Q-Q-K[.1]
U 1260.	0019.2000.05C0.0800.0000.1261	:2124	1260:	Q-Q-K[.1]
U 1261.	0019.2000.05C0.0800.0000.1262	:2125	1261:	Q-Q-K[.1]
U 1262.	0019.2000.05C0.0800.0000.1263	:2126	1262:	Q-Q-K[.1]
U 1263.	0019.2000.05C0.0800.0000.1264	:2127	1263:	Q-Q-K[.1]
U 1264.	0019.2000.05C0.0800.0000.1265	:2128	1264:	Q-Q-K[.1]
U 1265.	0019.2000.05C0.0800.0000.1266	:2129	1265:	Q-Q-K[.1]
U 1266.	0019.2000.05C0.0800.0000.1267	:2130	1266:	Q-Q-K[.1]
U 1267.	0019.2000.05C0.0800.0000.1268	:2131	1267:	Q-Q-K[.1]
U 1268.	0019.2000.05C0.0800.0000.1269	:2132	1268:	Q-Q-K[.1]
U 1269.	0019.2000.05C0.0800.0000.126A	:2133	1269:	Q-Q-K[.1]
U 126A.	0019.2000.05C0.0800.0000.126B	:2134	126A:	Q-Q-K[.1]
U 126B.	0019.2000.05C0.0800.0000.126C	:2135	126B:	Q-Q-K[.1]
U 126C.	0019.2000.05C0.0800.0000.126D	:2136	126C:	Q-Q-K[.1]
U 126D.	0019.2000.05C0.0800.0000.126E	:2137	126D:	Q-Q-K[.1]
U 126E.	0019.2000.05C0.0800.0000.126F	:2138	126E:	Q-Q-K[.1]
U 126F.	0019.2000.05C0.0800.0000.1270	:2139	126F:	Q-Q-K[.1]
U 1270.	0019.2000.05C0.0800.0000.1271	:2140	1270:	Q-Q-K[.1]
U 1271.	0019.2000.05C0.0800.0000.1272	:2141	1271:	Q-Q-K[.1]
U 1272.	0019.2000.05C0.0800.0000.1273	:2142	1272:	Q-Q-K[.1]
U 1273.	0019.2000.05C0.0800.0000.1274	:2143	1273:	Q-Q-K[.1]
U 1274.	0019.2000.05C0.0800.0000.1275	:2144	1274:	Q-Q-K[.1]
U 1275.	0019.2000.05C0.0800.0000.1276	:2145	1275:	Q-Q-K[.1]
U 1276.	0019.2000.05C0.0800.0000.1277	:2146	1276:	Q-Q-K[.1]
U 1277.	0019.2000.05C0.0800.0000.1278	:2147	1277:	Q-Q-K[.1]
U 1278.	0019.2000.05C0.0800.0000.1279	:2148	1278:	Q-Q-K[.1]
U 1279.	0019.2000.05C0.0800.0000.127A	:2149	1279:	Q-Q-K[.1]
U 127A.	0019.2000.05C0.0800.0000.127B	:2150	127A:	Q-Q-K[.1]
U 127B.	0019.2000.05C0.0800.0000.127C	:2151	127B:	Q-Q-K[.1]
U 127C.	0019.2000.05C0.0800.0000.127D	:2152	127C:	Q-Q-K[.1]
U 127D.	0019.2000.05C0.0800.0000.127E	:2153	127D:	Q-Q-K[.1]
U 127E.	0019.2000.05C0.0800.0000.127F	:2154	127E:	Q-Q-K[.1]
U 127F.	0019.2000.05C0.0800.0000.1280	:2155	127F:	Q-Q-K[.1]
U 1280.	0019.2000.05C0.0800.0000.1281	:2156	1280:	Q-Q-K[.1]
U 1281.	0019.2000.05C0.0800.0000.1282	:2157	1281:	Q-Q-K[.1]
U 1282.	0019.2000.05C0.0800.0000.1283	:2158	1282:	Q-Q-K[.1]
U 1283.	0019.2000.05C0.0800.0000.1284	:2159	1283:	Q-Q-K[.1]
U 1284.	0019.2000.05C0.0800.0000.1285	:2160	1284:	Q-Q-K[.1]
U 1285.	0019.2000.05C0.0800.0000.1286	:2161	1285:	Q-Q-K[.1]
U 1286.	0019.2000.05C0.0800.0000.1287	:2162	1286:	Q-Q-K[.1]
U 1287.	0019.2000.05C0.0800.0000.1288	:2163	1287:	Q-Q-K[.1]
U 1288.	0019.2000.05C0.0800.0000.1289	:2164	1288:	Q-Q-K[.1]
U 1289.	0019.2000.05C0.0800.0000.128A	:2165	1289:	Q-Q-K[.1]
U 128A.	0019.2000.05C0.0800.0000.128B	:2166	128A:	Q-Q-K[.1]
U 128B.	0019.2000.05C0.0800.0000.128C	:2167	128B:	Q-Q-K[.1]
U 128C.	0019.2000.05C0.0800.0000.128D	:2168	128C:	Q-Q-K[.1]
U 128D.	0019.2000.05C0.0800.0000.128E	:2169	128D:	Q-Q-K[.1]
U 128E.	0019.2000.05C0.0800.0000.128F	:2170	128E:	Q-Q-K[.1]
U 128F.	0019.2000.05C0.0800.0000.1290	:2171	128F:	Q-Q-K[.1]
U 1290.	0019.2000.05C0.0800.0000.1291	:2172	1290:	Q-Q-K[.1]
U 1291.	0019.2000.05C0.0800.0000.1292	:2173	1291:	Q-Q-K[.1]
U 1292.	0019.2000.05C0.0800.0000.1293	:2174	1292:	Q-Q-K[.1]
U 1293.	0019.2000.05C0.0800.0000.1294	:2175	1293:	Q-Q-K[.1]

U 1294.	0019.2000.05C0.0800.0000.1295	:2176	1294:	Q-Q-K[.1]
U 1295.	0019.2000.05C0.0800.0000.1296	:2177	1295:	Q-Q-K[.1]
U 1296.	0019.2000.05C0.0800.0000.1297	:2178	1296:	Q-Q-K[.1]
U 1297.	0019.2000.05C0.0800.0000.1298	:2179	1297:	Q-Q-K[.1]
U 1298.	0019.2000.05C0.0800.0000.1299	:2180	1298:	Q-Q-K[.1]
U 1299.	0019.2000.05C0.0800.0000.129A	:2181	1299:	Q-Q-K[.1]
U 129A.	0019.2000.05C0.0800.0000.129B	:2182	129A:	Q-Q-K[.1]
U 129B.	0019.2000.05C0.0800.0000.129C	:2183	129B:	Q-Q-K[.1]
U 129C.	0019.2000.05C0.0800.0000.129D	:2184	129C:	Q-Q-K[.1]
U 129D.	0019.2000.05C0.0800.0000.129E	:2185	129D:	Q-Q-K[.1]
U 129E.	0019.2000.05C0.0800.0000.129F	:2186	129E:	Q-Q-K[.1]
U 129F.	0019.2000.05C0.0800.0000.12A0	:2187	129F:	Q-Q-K[.1]
U 12A0.	0019.2000.05C0.0800.0000.12A1	:2188	12A0:	Q-Q-K[.1]
U 12A1.	0019.2000.05C0.0800.0000.12A2	:2189	12A1:	Q-Q-K[.1]
U 12A2.	0019.2000.05C0.0800.0000.12A3	:2190	12A2:	Q-Q-K[.1]
U 12A3.	0019.2000.05C0.0800.0000.12A4	:2191	12A3:	Q-Q-K[.1]
U 12A4.	0019.2000.05C0.0800.0000.12A5	:2192	12A4:	Q-Q-K[.1]
U 12A5.	0019.2000.05C0.0800.0000.12A6	:2193	12A5:	Q-Q-K[.1]
U 12A6.	0019.2000.05C0.0800.0000.12A7	:2194	12A6:	Q-Q-K[.1]
U 12A7.	0019.2000.05C0.0800.0000.12A8	:2195	12A7:	Q-Q-K[.1]
U 12A8.	0019.2000.05C0.0800.0000.12A9	:2196	12A8:	Q-Q-K[.1]
U 12A9.	0019.2000.05C0.0800.0000.12AA	:2197	12A9:	Q-Q-K[.1]
U 12AA.	0019.2000.05C0.0800.0000.12AB	:2198	12AA:	Q-Q-K[.1]
U 12AB.	0019.2000.05C0.0800.0000.12AC	:2199	12AB:	Q-Q-K[.1]
U 12AC.	0019.2000.05C0.0800.0000.12AD	:2200	12AC:	Q-Q-K[.1]
U 12AD.	0019.2000.05C0.0800.0000.12AE	:2201	12AD:	Q-Q-K[.1]
U 12AE.	0019.2000.05C0.0800.0000.12AF	:2202	12AE:	Q-Q-K[.1]
U 12AF.	0019.2000.05C0.0800.0000.12B0	:2203	12AF:	Q-Q-K[.1]
U 12B0.	0019.2000.05C0.0800.0000.12B1	:2204	12B0:	Q-Q-K[.1]
U 12B1.	0019.2000.05C0.0800.0000.12B2	:2205	12B1:	Q-Q-K[.1]
U 12B2.	0019.2000.05C0.0800.0000.12B3	:2206	12B2:	Q-Q-K[.1]
U 12B3.	0019.2000.05C0.0800.0000.12B4	:2207	12B3:	Q-Q-K[.1]
U 12B4.	0019.2000.05C0.0800.0000.12B5	:2208	12B4:	Q-Q-K[.1]
U 12B5.	0019.2000.05C0.0800.0000.12B6	:2209	12B5:	Q-Q-K[.1]
U 12B6.	0019.2000.05C0.0800.0000.12B7	:2210	12B6:	Q-Q-K[.1]
U 12B7.	0019.2000.05C0.0800.0000.12B8	:2211	12B7:	Q-Q-K[.1]
U 12B8.	0019.2000.05C0.0800.0000.12B9	:2212	12B8:	Q-Q-K[.1]
U 12B9.	0019.2000.05C0.0800.0000.12BA	:2213	12B9:	Q-Q-K[.1]
U 12BA.	0019.2000.05C0.0800.0000.12BB	:2214	12BA:	Q-Q-K[.1]
U 12BB.	0019.2000.05C0.0800.0000.12BC	:2215	12BB:	Q-Q-K[.1]
U 12BC.	0019.2000.05C0.0800.0000.12BD	:2216	12BC:	Q-Q-K[.1]
U 12BD.	0019.2000.05C0.0800.0000.12BE	:2217	12BD:	Q-Q-K[.1]
U 12BE.	0019.2000.05C0.0800.0000.12BF	:2218	12BE:	Q-Q-K[.1]
U 12BF.	0019.2000.05C0.0800.0000.12C0	:2219	12BF:	Q-Q-K[.1]
U 12C0.	0019.2000.05C0.0800.0000.12C1	:2220	12C0:	Q-Q-K[.1]
U 12C1.	0019.2000.05C0.0800.0000.12C2	:2221	12C1:	Q-Q-K[.1]
U 12C2.	0019.2000.05C0.0800.0000.12C3	:2222	12C2:	Q-Q-K[.1]
U 12C3.	0019.2000.05C0.0800.0000.12C4	:2223	12C3:	Q-Q-K[.1]
U 12C4.	0019.2000.05C0.0800.0000.12C5	:2224	12C4:	Q-Q-K[.1]
U 12C5.	0019.2000.05C0.0800.0000.12C6	:2225	12C5:	Q-Q-K[.1]
U 12C6.	0019.2000.05C0.0800.0000.12C7	:2226	12C6:	Q-Q-K[.1]
U 12C7.	0019.2000.05C0.0800.0000.12C8	:2227	12C7:	Q-Q-K[.1]
U 12C8.	0019.2000.05C0.0800.0000.12C9	:2228	12C8:	Q-Q-K[.1]
U 12C9.	0019.2000.05C0.0800.0000.12CA	:2229	12C9:	Q-Q-K[.1]
U 12CA.	0019.2000.05C0.0800.0000.12CB	:2230	12CA:	Q-Q-K[.1]

ZZ-ESKAH-V132 Subroutines
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U 12CB,	0019,2000,05C0,0800,0000,12CC	:2231	12CB:	Q-Q-K[.1]
U 12CC,	0019,2000,05C0,0800,0000,12CD	:2232	12CC:	Q-Q-K[.1]
U 12CD,	0019,2000,05C0,0800,0000,12CE	:2233	12CD:	Q-Q-K[.1]
U 12CE,	0019,2000,05C0,0800,0000,12CF	:2234	12CE:	Q-Q-K[.1]
U 12CF,	0019,2000,05C0,0800,0000,12D0	:2235	12CF:	Q-Q-K[.1]
U 12D0,	0019,2000,05C0,0800,0000,12D1	:2236	12D0:	Q-Q-K[.1]
U 12D1,	0019,2000,05C0,0800,0000,12D2	:2237	12D1:	Q-Q-K[.1]
U 12D2,	0019,2000,05C0,0800,0000,12D3	:2238	12D2:	Q-Q-K[.1]
U 12D3,	0019,2000,05C0,0800,0000,12D4	:2239	12D3:	Q-Q-K[.1]
U 12D4,	0019,2000,05C0,0800,0000,12D5	:2240	12D4:	Q-Q-K[.1]
U 12D5,	0019,2000,05C0,0800,0000,12D6	:2241	12D5:	Q-Q-K[.1]
U 12D6,	0019,2000,05C0,0800,0000,12D7	:2242	12D6:	Q-Q-K[.1]
U 12D7,	0019,2000,05C0,0800,0000,12D8	:2243	12D7:	Q-Q-K[.1]
U 12D8,	0019,2000,05C0,0800,0000,12D9	:2244	12D8:	Q-Q-K[.1]
U 12D9,	0019,2000,05C0,0800,0000,12DA	:2245	12D9:	Q-Q-K[.1]
U 12DA,	0019,2000,05C0,0800,0000,12DB	:2246	12DA:	Q-Q-K[.1]
U 12DB,	0019,2000,05C0,0800,0000,12DC	:2247	12DB:	Q-Q-K[.1]
U 12DC,	0019,2000,05C0,0800,0000,12DD	:2248	12DC:	Q-Q-K[.1]
U 12DD,	0019,2000,05C0,0800,0000,12DE	:2249	12DD:	Q-Q-K[.1]
U 12DE,	0019,2000,05C0,0800,0000,12DF	:2250	12DE:	Q-Q-K[.1]
U 12DF,	0019,2000,05C0,0800,0000,12E0	:2251	12DF:	Q-Q-K[.1]
U 12E0,	0019,2000,05C0,0800,0000,12E1	:2252	12E0:	Q-Q-K[.1]
U 12E1,	0019,2000,05C0,0800,0000,12E2	:2253	12E1:	Q-Q-K[.1]
U 12E2,	0019,2000,05C0,0800,0000,12E3	:2254	12E2:	Q-Q-K[.1]
U 12E3,	0019,2000,05C0,0800,0000,12E4	:2255	12E3:	Q-Q-K[.1]
U 12E4,	0019,2000,05C0,0800,0000,12E5	:2256	12E4:	Q-Q-K[.1]
U 12E5,	0019,2000,05C0,0800,0000,12E6	:2257	12E5:	Q-Q-K[.1]
U 12E6,	0019,2000,05C0,0800,0000,12E7	:2258	12E6:	Q-Q-K[.1]
U 12E7,	0019,2000,05C0,0800,0000,12E8	:2259	12E7:	Q-Q-K[.1]
U 12E8,	0019,2000,05C0,0800,0000,12E9	:2260	12E8:	Q-Q-K[.1]
U 12E9,	0019,2000,05C0,0800,0000,12EA	:2261	12E9:	Q-Q-K[.1]
U 12EA,	0019,2000,05C0,0800,0000,12EB	:2262	12EA:	Q-Q-K[.1]
U 12EB,	0019,2000,05C0,0800,0000,12EC	:2263	12EB:	Q-Q-K[.1]
U 12EC,	0019,2000,05C0,0800,0000,12ED	:2264	12EC:	Q-Q-K[.1]
U 12ED,	0019,2000,05C0,0800,0000,12EE	:2265	12ED:	Q-Q-K[.1]
U 12EE,	0019,2000,05C0,0800,0000,12EF	:2266	12EE:	Q-Q-K[.1]
U 12EF,	0019,2000,05C0,0800,0000,12F0	:2267	12EF:	Q-Q-K[.1]
U 12F0,	0019,2000,05C0,0800,0000,12F1	:2268	12F0:	Q-Q-K[.1]
U 12F1,	0019,2000,05C0,0800,0000,12F2	:2269	12F1:	Q-Q-K[.1]
U 12F2,	0019,2000,05C0,0800,0000,12F3	:2270	12F2:	Q-Q-K[.1]
U 12F3,	0019,2000,05C0,0800,0000,12F4	:2271	12F3:	Q-Q-K[.1]
U 12F4,	0019,2000,05C0,0800,0000,12F5	:2272	12F4:	Q-Q-K[.1]
U 12F5,	0019,2000,05C0,0800,0000,12F6	:2273	12F5:	Q-Q-K[.1]
U 12F6,	0019,2000,05C0,0800,0000,12F7	:2274	12F6:	Q-Q-K[.1]
U 12F7,	0019,2000,05C0,0800,0000,12F8	:2275	12F7:	Q-Q-K[.1]
U 12F8,	0019,2000,05C0,0800,0000,12F9	:2276	12F8:	Q-Q-K[.1]
U 12F9,	0019,2000,05C0,0800,0000,12FA	:2277	12F9:	Q-Q-K[.1]
U 12FA,	0019,2000,05C0,0800,0000,12FB	:2278	12FA:	Q-Q-K[.1]
U 12FB,	0019,2000,05C0,0800,0000,12FC	:2279	12FB:	Q-Q-K[.1]
U 12FC,	0019,2000,05C0,0800,0000,12FD	:2280	12FC:	Q-Q-K[.1]
U 12FD,	0019,2000,05C0,0800,0000,12FE	:2281	12FD:	Q-Q-K[.1]
U 12FE,	0019,2000,05C0,0800,0000,12FF	:2282	12FE:	Q-Q-K[.1]
U 12FF,	0019,2002,05C0,0800,0000,0001	:2283	12FF:	Q-Q-K[.1],RETURN
		:2284		
		:2285		


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:2286 :+
:2287 : THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
:2288 : CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
:2289 : IS COMPLETELY FULL OF DATA.
:2290 :
:2291 : BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
:2292 :-
:2293
U 11C5, 3000,003C,0180,6000,0000,11C6 :2294 IBWAIT: LOAD.IB,IBC/START
U 11C6, 0000,003C,0180,F800,0000,11C7 :2295 MCT/ALLOW.IB.READ
U 11C7, 0000,003C,0180,F800,0000,11C8 :2296 MCT/ALLOW.IB.READ
U 11C8, 0000,003C,0180,F800,0000,11C9 :2297 MCT/ALLOW.IB.READ
U 11C9, 0000,003C,0180,F800,0000,11CA :2298 MCT/ALLOW.IB.READ
:2299
U 11CA, 0000,003C,0180,F800,0000,11CB :2300 SYNC01:
U 11CB, 1000,003E,0180,F800,0000,0001 :2301 WAIT1: MCT/ALLOW.IB.READ
:2302 MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
:2303
:2304 IBWAITONCE:
U 11CC, 3000,003C,0180,6000,0000,11CA :2305 LOAD.IB,IBC/START,J/WAIT1

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2306 .PAGE "TEST 11C VALID BIT GENERATION (CONTINUED)"
2307 *****
2308 ++
2309 .TEST 11C VALID BIT GENERATION (CONTINUED)
2310
2311 .TEST DESCRIPTION
2312 .THIS TEST CHECKS THAT THE CORRECT BYTES ARE MARKED VALID, WHEN
2313 .THEY ARE RECEIVED FROM THE CACHE, AS A FUNCTION OF THE VALUES
2314 .OF IBA BITS<1:0>. THIS IS DONE BY LOADING THE IBA WITH THE SPECIFIED
2315 .VALUE OF BITS<1:0>, STARTING THE INSTRUCTION BUFFER, WAITING FOR
2316 .THE SPECIFIED NUMBER OF CYCLES, FROM THE CACHE, STOPPING THE IB,
2317 .AND CHECKING THAT THE APPROPRIATE BYTES WERE MARKED VALID.
2318
2319 .SUBTST 1 - CHECK THAT AN IBA VALUE OF 10 AND 1 READ FROM CACHE AND
2320 .BYTES 5-0 ARE ALREADY VALID, VALIDATES BYTES 6 & 7.
2321 .SUBTST 2 - CHECK THAT AN IBA VALUE OF 01 AND 1 READ FROM CACHE AND
2322 .BYTES 6-0 ARE ALREADY VALID, VALIDATES BYTE 7.
2323
2324 .LOGIC DESCRIPTION
2325 .THIS TEST CHECKS THE VALID BIT GENERATION LOGIC ON THE IDP MODULE.
2326
2327 .ERROR DESCRIPTION
2328 .DATA: EXPECTED MICRO PC BITS<7:0>
2329 .RECEIVED MICRO PC BITS<7:0>
2330 .BYTE LOOP COUNT -- SHOWS WHICH BYTE WAS BEING CHECK FOR VALIDITY:
2331 .7=BYTE 0, 6=BYTE 1, 5=BYTE 2, 4=BYTE 3, ETC.
2332 .THE EXPECTED ADDRESS WILL EITHER BE 8F (FOR VALID DATA) OR
2333 .7E (FOR INVALID DATA).
2334
2335 .SYNC POINT DESCRIPTION
2336 .ADDRESS SYNC01 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
2337 .WHEN 1 READ FROM CACHE IS REQUESTED, OR WHERE
2338 .THE SECOND LONG WORD FROM CACHE IS WRITTEN
2339 .INTO THE IB WHEN 2 READS FROM THE CACHE ARE REQUESTED.
2340
2341 --
2342 *****
2343 =0
2344 T11C: NEWTST[.3]
2345 NOP
2346 =0 D_K[.8],CALL[DCF] ; GEN EXPECTED DATA
2347 R[2]_D ; SAVE
2348
2349 ;////////////////////
2350 +
2351 .CHECK THAT BYTES 6 AND 7 LOAD WHEN IBA=2 AND BYTES 0-5 ARE VALID
2352 -
2353 T11CS1: R[1] K[.2] ; SET ADR OF IB DATA
2354 =0 SUBTEST
2355 LAB R[2]
2356 RC[OE]_LA ; LOAD EXP ADR
2357
2358 =0 ERLOOP
2359 RC[OC] K[.8] ; SET THE LOOP COUNT
2360 =0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; FILL THE IBUFFER
    
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U 1008, 0018,0039,0D80,09F8,0000,1191
 U 1009, 0000,003C,0180,0800,0000,100A
 U 100A, 0818,0039,0180,0800,0000,11B9
 U 100B, 0001,003C,0180,0A90,0000,11CD

U 11CD, 0018,0038,0980,0A88,0000,100C
 U 100C, 0000,003D,0180,0800,0000,11BF
 U 100D, 0000,003C,0180,0A10,0000,11CE
 U 11CE, 0000,003C,0180,09F0,0000,100E

U 100E, 0000,003D,0180,0800,0000,11A5
 U 100F, 0018,0038,0180,09E0,0000,1010
 U 1010, 2003,003D,0180,0800,4200,11C5

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U 1011, 4000,003C,0180,0800,0000,1012 :2361      IBC/CLR.0.1      ; MAKE BYTES 6 AND 7 INVALID
U 1012, 0000,003D,0180,0A09,0200,11CC :2362      =0      ALU_R[1],VA_ALU,PCK/PC_VA,CALL,J/IBWAITONCE ; LOAD A NEW PC OF IBA=2
U 1013, 0810,0038,0180,0970,0000,1014 :2363      T11CL12:D R[OE]      ; GET EXP ADR
U 1014, 0000,003D,0180,0800,0000,11C4 :2364      =0      CALL,J/DISPAT      ; CHECK THE BYTES
U 1015, 001D,A000,0180,0800,0010,11CF :2365      ALU_Q-D,CLK.UBCC,BYTE      ; ADR OK?
U 11CF, 0810,0138,0180,0960,0000,1016 :2366      Z?,D R[OC]      ; BRANCH IF YES
U 1016, 0001,A03D,0180,09E8,0000,11A6 :2367      =0      ERROR1,R[OD],Q,BYTE      ;
U 1017, 0019,8000,0580,09E0,0010,11D0 :2368      R[OC],D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 11D0, C000,013C,0180,0800,0000,1018 :2369      Z?,IBC7CLR.0      ; BRANCH IF DONE
U 1018, 0000,003C,0180,0A10,0000,1013 :2370      =0      LAB_R[2],J/T11CL12      ; CONTINUE TESTING
U 1019, 0000,003C,0180,0800,0000,101A :2371      NOP
:2372      ;////////////////////////////////////
:2373      ;+
:2374      ; CHECK THAT BYTE 7 LOADS WHEN IBA=1 AND BYTES 0-6 ARE VALID
:2375      ;-
:2376
U 101A, 0000,003D,0180,0800,0000,11BF :2377      =0      SUBTEST
U 101B, 0018,0038,0580,0A88,0000,101C :2378      R[1],K[.1]      ; SET IBA = 1
:2379      T11CS2:
U 101C, 0000,003D,0180,0800,0000,11A5 :2380      =0      ERLOOP
U 101D, 0018,0038,0180,09E0,0000,101E :2381      R[OC],K[.8]      ; SET THE LOOP COUNT
U 101E, 2003,003D,0180,0800,4200,11C5 :2382      =0      ALU_Q(A),FLUSH.IB,CALL,J/IBWAIT      ; FILL THE IBUFFER
U 101F, C000,003C,0180,0800,0000,1020 :2383      IBC7CLR.0      ; MAKE BYTE 7 INVALID
U 1020, 0000,003D,0180,0A09,0200,11CC :2384      =0      ALU_R[1],VA_ALU,PCK/PC_VA,CALL,J/IBWAITONCE ; LOAD A NEW PC OF IBA=1
U 1021, 0810,0038,0180,0970,0000,1022 :2385      T11CL13:D R[OE]      ; GET EXP ADR
U 1022, 0000,003D,0180,0800,0000,11C4 :2386      =0      CALL,J/DISPAT      ; CHECK THE BYTES
U 1023, 001D,A000,0180,0800,0010,11D1 :2387      ALU_Q-D,CLK.UBCC,BYTE      ; ADR OK?
U 11D1, 0810,0138,0180,0960,0000,1024 :2388      Z?,D R[OC]      ; BRANCH IF YES
U 1024, 0001,A03D,0180,09E8,0000,11A6 :2389      =0      ERROR1,R[OD],Q,BYTE      ;
U 1025, 0019,8000,0580,09E0,0010,11D2 :2390      R[OC],D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 11D2, C000,013C,0180,0800,0000,1026 :2391      Z?,IBC7CLR.0      ; BRANCH IF DONE
U 1026, 0000,003C,0180,0A10,0000,1021 :2392      =0      LAB_R[2],J/T11CL13      ; CONTINUE TESTING
U 1027, 0000,003C,0180,0800,0000,1028 :2393      NOP
:2394
:2395      ; THE FOLLOWING IS THE IB DATA IS USED IN THE ABOVE TEST
:2396      ;X 0
:2397      ;$ 0000,0000,0000,0000,0000,0000,0000,0000
    
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U 1028, 0018,0039,0D80,09F8,0000,1191
U 1029, 0003,003C,0180,0A88,0000,11D3
U 11D3, 0018,0038,6580,0A90,0000,11D4
U 11D4, 0018,0038,3180,0A80,0000,102A
U 102A, 0818,0039,5D80,0800,0000,11B8
U 102B, 0001,003C,0180,09F0,0000,102C

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PAGE "TEST 11D STALL CONTROL LOGIC"
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TEST 11D STALL CONTROL LOGIC

TEST DESCRIPTION
THIS TEST CHECKS THOSE CONDITIONS THAT CAN CAUSE THE INSTRUCTION
BUFFER TO ASCERT THE STALL SIGNAL.
SINCE THE STALL CONDITION IS A FUNCTION OF HOW MANY VALID BYTES ARE
IN THE BUFFER, DIFFERENT VALUES OF IBA BITS<1:0> ARE USED TO LOAD
THE APPROPRIATE NUMBER OF BYTES INTO THE BUFFER. THE STALL SIGNAL
IS ALSO A FUNCTION OF THE OPCODE IN BYTE 0 OF THE BUFFER.
WITH THE ABOVE TWO CONSTRAINTS IN MIND, THE TEST WORKS AS FOLLOWS:
READ THE DATA TO LOAD INTO THE IB FROM THE CACHE AND SAVE IT. THEN
READ THE IBA VALUE TO USE FROM THE CACHE AND LOAD IT INTO THE VA.
THEN WRITE THE IB DATA (THAT WAS SAVED), TO THE CACHE.
THE IB THEN PICKS UP THE APPROPRIATE DATA WITH THE APPROPRIATE VALUE
OF IBA BITS<1:0>.

SUBTST 1 - IB STALL IS TRUE WITH 5 DIFFERANT OP CODES.
SUBTST 2 - IB STALL IS FALSE WITH 4 DIFFERANT OPCODES.
SUBTST 3 - IB STALL TRUE BECAUSE BYTE 1 IS INVALID.
SUBTST 4 - IB STALL TRUE BECAUSE BYTE 5 IS INVALID.
SUBTST 5 - IB STALL TRUE BECAUSE BYTE 2 IS INVALID AND 'VAX DECODE
3" IS ASSERTED, AND 'BDEST" IS DEASSERTED.

LOGIC DESCRIPTION
THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES THE
"STALL+SVC" SIGNAL IN VAX MODE.

ERROR DESCRIPTION
DATA: EXPECTED MICRO PC BITS<7:0>
RECEIVED MICRO PC BITS<7:0>
LOOP COUNT THAT INDICATES WHAT OPCODE IS IN THE BUFFER
(SEE THE DATA TABLE AT THE END OF THE TEST)

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC02--"STALL+SVC" SHOULD BE TRUE
SUBTST 2 - SYNC03--"STALL+SVC" SHOULD BE FLASE
SUBTST 3 - SYNC04--"STALL+SVC" SHOULD BE TRUE
SUBTST 4 - SYNC05--"STALL+SVC" SHOULD BE TRUE
SUBTST 5 - SYNC06--"STALL+SVC" SHOULD BE TRUE

--
*****
=0
T11D: NEWTST[.3] ;
R[1]_0 ;
R[2]_K[.10] ; ADDRESS OF IB DATA
R[0]_K[.40] ; ADDRESS OF IB ADDRESS
=0 D_K[.7],CALL,J/DCE ; GEN ADDRESS OF STALL MICRO STATE
R[0E]_D ; SAVE

////////////////////////////////////
+
IB STALL TRUE AND ONLY ONE IB FETCH

```

00000000
00000000


```

:2453
:2454
:2455
U 102C, 0000,003D,0180,0800,0000,11BF :2455
U 102D, 0818,0038,1180,0800,0000,11D5 :2456
U 11D5, 0019,0014,0580,09E0,0000,11D6 :2457
U 11D6, 0000,003C,0180,0A10,0200,11D7 :2458
U 11D7, 0000,403C,0180,C800,0000,11D8 :2459
U 11D8, 0000,003C,01E0,0A00,0200,11D9 :2460
U 11D9, 0000,403C,0180,C800,0000,11DA :2461
U 11DA, 0C03,403C,0180,0A88,0200,11DB :2462
U 11DB, 0000,403C,0180,A800,0000,102E :2463
U 102E, 0000,003D,0180,0800,0000,11A5 :2464
U 102F, 0810,0038,0180,0970,0000,1030 :2465
U 1030, 2000,003D,0180,0A08,4200,11CC :2466
U 1031, 0000,003C,0180,0800,0000,1032 :2467
U 1032, 0000,003D,0180,0800,0000,11C4 :2468
U 1033, 001D,A000,0180,0800,0010,11DC :2469
U 11DC, 0800,013C,0180,0A10,0000,1034 :2470
U 1034, 0001,A03D,0180,09E8,0000,11AB :2471
:2472
:2473
:2474
:2475
:2476
U 1035, 0800,003C,0180,0A10,0000,11DD :2477
U 11DD, 0019,0014,0980,0A90,0000,11DE :2478
U 11DE, 0000,003C,0180,0A00,0000,11DF :2479
U 11DF, 0018,0014,0980,0A80,0000,11E0 :2480
U 11E0, 0810,0038,0180,0960,0000,11E1 :2481
U 11E1, 0019,8000,0580,09E0,0010,11E2 :2482
U 11E2, 0000,013C,0180,0800,0000,1036 :2483
U 1036, 0000,003C,0180,0800,0000,11D6 :2484
:2485
:2486
:2487
:2488
:2489
:2490
:2491
U 1037, 0000,003C,0180,0800,0000,1038 :2492
U 1038, 0000,003D,0180,0800,0000,11BF :2493
U 1039, 0018,0038,1180,09E0,0000,11E3 :2494
U 11E3, 0000,003C,0180,0A10,0200,11E4 :2495
U 11E4, 0000,403C,0180,C800,0000,11E5 :2496
U 11E5, 0000,003C,01E0,0A00,0200,11E6 :2497
U 11E6, 0000,403C,0180,C800,0000,11E7 :2498
U 11E7, 0C03,403C,0180,0A88,0200,11E8 :2499
U 11E8, 0000,403C,0180,A800,0000,103A :2500
U 103A, 0000,003D,0180,0800,0000,11A5 :2501
U 103B, 0810,0038,0180,0970,0000,103C :2502
U 103C, 2000,003D,0180,0A08,4200,11CC :2503
U 103D, 0000,003C,0180,0800,0000,103E :2504
U 103E, 0000,003D,0180,0800,0000,11C4 :2505
U 103F, 001D,A000,0180,0800,0010,11E9 :2506
U 11E9, 0800,013C,0180,0A10,0000,1040 :2507

;-
=0 SUBTEST
T11DS1: D K[.4] ; SET THE LOOP COUNT
T11DL1: VA R[2] ; LOAD ADR OF IB DATA
D[WORD]_CACHE.P ; FETCH THE DATA
VA R[0],Q D ; LOAD ADDRESS OF IB ADDRESS
D[WORD]_CACHE.P ; FETCH THE ADDRESS
VA D.OXT[WORD],R[1]_ALU,D_Q ; LOAD THE ADDRESS
CACHE.P_D[WORD] ; WRITE THE DATA TO THE ADDRESS
=0 ERLOOP
D RC[OE] ; GET EXP DISPAT ADDRESS
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
SYNC02: NOP
=0 CALL,J/DISPAT ; EXECUT THE CALL 3
ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D R[2] ; BRANCH IF YES
=0 ERROR2,RC[OD]_Q,BYTE

;+
; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
;-
D R[2]
R[2] D+K[.2] ; UPDATE ADR OF IB DATA
LAB R[0]
R[0] LA+K[.2] ; UPDATE ADR OF IB ADDRESS
D RC[OC]
R[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z? ; BRANCH IF DONE
=0 J/T11DL1

;//////////////////////////////////////
;+
; IB STALL FALSE ONLY ONE CYCLE
;-
NOP
=0 SUBTEST
T11DS2: RC[OC] K[.4] ; SET THE LOOP COUNT
T11DL2: VA R[2] ; LOAD ADR OF IB DATA
D[WORD]_CACHE.P ; FETCH THE DATA
VA R[0],Q D ; LOAD ADDRESS OF IB ADDRESS
D[WORD]_CACHE.P ; FETCH THE ADDRESS
VA D.OXT[WORD],R[1]_ALU,D_Q ; LOAD THE ADDRESS
CACHE.P_D[WORD] ; WRITE THE DATA TO THE ADDRESS
=0 ERLOOP
D RC[OE] ; GET EXP DISPAT ADDRESS
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
SYNC03: NOP
=0 CALL,J/DISPAT ; EXECUT THE CALL 3
ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D R[2] ; BRANCH IF NO

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U 1040, 0800,003C,0180,0A10,0000,11EA :2508
U 1041, 0001,203D,0180,09E8,0000,11A6 :2509
U 11EA, 0019,0014,0980,0A90,0000,11EB :2510
U 11EB, 0000,003C,0180,0A00,0000,11EC :2511
U 11EC, 0018,0014,0980,0A80,0000,11ED :2512
U 11ED, 0810,0038,0180,0960,0000,11EE :2513
U 11EE, 0019,8000,0580,09E0,0010,11EF :2514
U 11EF, 0000,013C,0180,0800,0000,1042 :2515
U 1042, 0000,003C,0180,0800,0000,11E3 :2516
:2517
:2518
:2519
:2520
:2521
:2522
:2523
U 1043, 0000,003C,0180,0800,0000,1044 :2524
U 1044, 0000,003D,0180,0800,0000,11BF :2525
U 1045, 0000,003C,0180,0A10,0200,11F0 :2526
U 11F0, 0000,403C,0180,C800,0000,11F1 :2527
U 11F1, 0000,003C,01E0,0A00,0200,11F2 :2528
U 11F2, 0000,403C,0180,C800,0000,11F3 :2529
U 11F3, 0C03,403C,0180,0A88,0200,11F4 :2530
U 11F4, 0000,403C,0180,A800,0000,1046 :2531
U 1046, 0000,003D,0180,0800,0000,11A5 :2532
U 1047, 0810,0038,0180,0970,0000,1048 :2533
U 1048, 2000,003D,0180,0A08,4200,11CC :2534
U 1049, C000,003C,0180,0800,0000,104A :2535
:2536
U 104A, 0000,003D,0180,0800,0000,11C4 :2537
U 104B, 001D,A000,0180,0800,0010,11F5 :2538
U 11F5, 0800,013C,0180,0A10,0000,104C :2539
U 104C, 0001,A03D,0180,09E8,0000,11A6 :2540
U 104D, 0800,003C,0180,0A10,0000,11F6 :2541
U 11F6, 0019,0014,0980,0A90,0000,11F7 :2542
U 11F7, 0000,003C,0180,0A00,0000,11F8 :2543
U 11F8, 0018,0014,0980,0A80,0000,1050 :2544
:2545
:2546
:2547
:2548
:2549
:2550
:2551
U 1050, 0000,003D,0180,0800,0000,11BF :2552
U 1051, 0018,0038,0980,09E0,0000,11F9 :2553
U 11F9, 0000,003C,0180,0A10,0200,11FA :2554
U 11FA, 0000,003C,0180,C800,0000,11FB :2555
U 11FB, 0000,003C,01E0,0A00,0200,11FC :2556
U 11FC, 0000,403C,0180,C800,0000,11FD :2557
U 11FD, 0C03,403C,0180,0A88,0200,11FE :2558
U 11FE, 0000,003C,0180,A800,0000,11FF :2559
U 11FF, 0800,003C,0180,0A10,0000,1300 :2560
U 1300, 001B,4014,1180,0800,0200,1301 :2561
U 1301, 0000,003C,0180,C800,0000,1302 :2562

```

```

=0 D R[2],J/T11DP1
ERROR1,R[0D]_Q
T11DP1: R[2] D+K[.2] ; UPDATE ADR OF IB DATA
LAB R[0]
R[0] LA+K[.2] ; UPDATE ADR OF IB ADDRESS
D R[0C]
R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z? ; BRANCH IF DONE
=0 J/T11DL2

:////////////////////////
: +
: IB STALL TRUE, BYTE 1 INVALID
:-

NOP
=0 SUBTEST
T11DS3: VA R[2] ; LOAD ADR OF IB DATA
D[WORD]_CACHE.P ; FETCH THE DATA
VA R[0]_Q D ; LOAD ADDRESS OF IB ADDRESS
D[WORD]_CACHE.P ; FETCH THE ADDRESS
VA D.OXT[WORD],R[1]_ALU,D_Q ; LOAD THE ADDRESS
CACHE.P_D[WORD] ; WRITE THE DATA TO THE ADDRESS
=0 ERLOOP
D R[0E] ; GET EXP DISPAT ADDRESS
=0 A[U R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
IBC7CLR.0 ; MAKE BYTE 1 INVALID
=0 SYNC04: CALL,J/DISPAT ; EXECUT THE CALL 3
ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D R[2] ; BRANCH IF YES
=0 ERROR1,R[0D]_Q,BYTE
D R[2]
R[2] D+K[.2] ; UPDATE ADR OF IB DATA
LAB R[0]
R[0]_LA+K[.2] ; UPDATE ADR OF IB ADDRESS

:////////////////////////
: +
: IB STALL TRUE, BYTE 5 INVALID
:-

=0 SUBTEST
T11DS4: R[0C]_K[.2] ; SET THE LOOP COUNT
T11DL3: VA R[2] ; LOAD ADR OF IB DATA
D[LONG]_CACHE.P ; FETCH THE DATA
VA R[0]_Q D ; LOAD ADDRESS OF IB ADDRESS
D[WORD]_CACHE.P ; FETCH THE ADDRESS
VA D.OXT[WORD],R[1]_ALU,D_Q ; LOAD THE ADDRESS
CACHE.P_D[LONG] ; WRITE THE DATA TO THE ADDRESS
D R[2]
VA D.OXT[WORD]+K[.4] ; GOING TO FETCH NEXT LONG WORD
D[LONG]_CACHE.P ; FETCH THE DATA

```

U 1302, 0800,003C,01E0,0A08,0000,1303 :2563
U 1303, 0C1B,4014,1180,0800,0200,1304 :2564
U 1304, 0000,003C,0180,A800,0000,1052 :2565
U 1052, 0000,003D,0180,0800,0000,11A5 :2566
U 1053, 0810,0038,0180,0970,0000,1054 :2567
U 1054, 2000,003D,0180,0A08,4200,11C5 :2568
U 1055, 4000,003C,0180,0800,0000,1305 :2569
U 1305, C000,003C,0180,0800,0000,1056 :2570
U 1056, 0000,003D,0180,0800,0000,11C4 :2571
U 1057, 001D,A000,0180,0800,0010,1306 :2572
U 1306, 0800,013C,0180,0A10,0000,1058 :2573
U 1058, 0001,A03D,0180,09E8,0000,11A8 :2574
U 1059, 0800,003C,0180,0A10,0000,1307 :2575
U 1307, 0019,0014,0180,0A90,0000,1308 :2576
U 1308, 0000,003C,0180,0A00,0000,1309 :2577
U 1309, 0018,0014,0980,0A80,0000,130A :2578
U 130A, 0810,0038,0180,0960,0000,130B :2579
U 130B, 0019,8000,0580,09E0,0010,130C :2580
U 130C, 0000,013C,0180,0800,0000,105C :2581
U 105C, 0000,003C,0180,0800,0000,11F9 :2582

D R[1],Q D
VA D.OXT[WORD]+K[.4],D_Q
CACHE.P_D[LONG] ; WRITE SECOND LONG WORD
ERLOOP
D RC[OE] ; GET EXP DISPAT ADDRESS
A[U R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE DATA
IBC7CLR.0.1 ; MAKE BYTE 5 INVALID
SYNCO5: IBC/CLR.0
=0 CALL,J/DISPAT ; EXECUT THE CALL 3
ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D R[2] ; BRANCH IF YES
=0 ERROR2,RC[OD]_Q,BYTE ;
D R[2]
R[2] D+K[.8] ; UPDATE ADR OF IB DATA
LAB R[0]
R[0] LA+K[.2] ; UPDATE ADR OF IB ADDRESS
D RC[OC]
R[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z? ; BRANCH IF DONE
=0 J/T11DL3

:/:IB STALL TRUE--BYTE 2 INVALID AND VAX DECODE 3 AND NOT BDEST
:-

U 105D, 0000,003C,0180,0800,0000,1060 :2590
U 1060, 0000,003D,0180,0800,0000,11BF :2591
U 1061, 0000,003C,0180,0A10,0200,130D :2592
U 130D, 0000,003C,0180,C800,0000,130E :2593
U 130E, 0000,003C,01E0,0A00,0200,130F :2594
U 130F, 0000,403C,0180,C800,0000,1310 :2595
U 1310, 0C03,403C,0180,0A88,0200,1311 :2596
U 1311, 0000,003C,0180,A800,0000,1312 :2597
U 1312, 0000,003C,0180,0A08,0000,1313 :2598
U 1313, 0018,0014,0580,0A88,0000,1062 :2599
U 1062, 0000,003D,0180,0800,0000,11A5 :2600
U 1063, 0810,0038,0180,0970,0000,1064 :2601
U 1064, 2000,003D,0180,0A08,4200,11CC :2602
U 1065, D000,003C,0180,0800,0000,1066 :2603
U 1066, 0000,003D,0180,0800,0000,11C4 :2605
U 1067, 001D,A000,0180,0800,0010,1314 :2606
U 1314, 0800,013C,0180,0A10,0000,1068 :2607
U 1068, 0001,A03D,0180,09E8,0000,11A6 :2608
U 1069, 0000,003C,0180,0800,0000,106A :2609

NOP
=0 SUBTEST
T11DS5: VA R[2] ; LOAD ADR OF IB DATA
D[LONG]_CACHE.P ; FETCH THE DATA
VA R[0],Q D ; LOAD ADDRESS OF IB ADDRESS
D[WORD]_CACHE.P ; FETCH THE ADDRESS
VA D.OXT[WORD],R[1]_ALU,D_Q ; LOAD THE ADDRESS
CACHE.P_D[LONG] ; WRITE THE DATA TO THE ADDRESS
LAB R[1]
R[1] LA+K[.1]
=0 ERLOOP
D RC[OE] ; GET EXP DISPAT ADDRESS
=0 A[U R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
IBC7CLR.1
=0
SYNCO6: CALL,J/DISPAT ; EXECUT THE CALL 3
ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D R[2] ; BRANCH IF YES
=0 ERROR1,RC[OD]_Q,BYTE ;
NOP

: FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
: X 10
: SUBTEST 1
: \$ 8F90,C090,8FB0,C095,0030
: SUBTEST 2
: \$ 8FB0,8F95,5073,5094
: SUBTEST 3

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```
:2618 :$ 9050
:2619 : SUBTEST 4
:2620 :$ 0000,9000,00E0,0000,0000,D000,008F,0000
:2621 : SUBTEST 5
:2622 :$ 8100,5000,5050
:2623 :
:2624 : FOLLOWING IS THE ADDRESS TO WRITE THE DATA AT FOR THE ABOVE TEST:
:2625 :X 40
:2626 : SUBTEST 1
:2627 :$ 502,501,501,501,502
:2628 : SUBTEST 2
:2629 :$ 500,501,502,502
:2630 : SUBTEST 3
:2631 :$ 502
:2632 : SUBTEST 4
:2633 :$ 500,500
:2634 : SUBTEST 5
:2635 :$ 500
:2636 :
```


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2641
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PAGE 'TEST 11E 'A FORK' OP CODE DECODE'

TEST 11E 'A FORK' OP CODE DECODE

TEST DESCRIPTION

THIS TEST CHECKS ALL THE INSTRUCTION ENTRY POINTS ON THE A FORK.
THIS IS DONE BY LOADING THE OPCODE INTO THE IB, EXECUTING THE
SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
FOLLOWING IS A LIST OF THE OPCODES THAT ARE CHECKED AND THEIR EXPECTED
A FORK ADDRESS. THE MOVBS AT THE END OF THE LIST ARE USED TO CHECK
THE SPECIFIER DECODE ADDRESSES.

INSTR	ADDRESS	INSTR	ADDRESS	
----	-----	----	-----	
HALT	8F	NOP	8E	
REI	8D	BPT	8C	
RET	8B	RSB	8A	
LDPCTX	89	SVPCTX	88	
BSBB	82	BRB	CE	
BSBW	82	BRW	CE	
RESERV	87	ESCD	85	
ESCE	81	ESCF	83	
CLRQ	42	CLRB	4F	SPECIFIED INDEPENDENT
MOVPSL	4E	ADDF2	64	
ADDF2	40	ADD2	66	
ADD2	42	ADD2	E4	
ADDB2	C0	CMPB	A4	OPTIMIZED
CMPB	80	TSTF	A8	
TSTB	AF	INCB	2F	
BLBS	AE	SOBGEQ	2E	EXECUTE IF R
MULF2	4	MULD2	6	
MOVQ	2	MOVQ	1F	SPECIFIED DEPENDENT
MOVB	0	MOVB	8	OPTIMIZED SELECT SPECIFIER
MOVB	C	MOVB	A	
MOVB	9	MOVB	B	
MOVB	D	MOVB	F	
MOVB	19	MOVB	1B	

LOGIC DESCRIPTION

THIS TEST CHECKS THAT VAX DECODE PROMS ON THE IRC MODULE.

ERROR DESCRIPTION

DATA: EXPECTED MICRO PC BITS <7:0>
RECEIVED MICRO PC BITS <7:0>
LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY UNDER TEST,
I.E., 2E=HALT, 2D=NOP, 2C=REI, 2B=BPT, 2A=RET, ETC.

```

:2692 ; SYNC POINT DESCRIPTION
:2693 ; ADDRESS SYNC00--MICRO PC BITS ARE ENABLED AT THE INSTRUCTION
:2694 ; FOLLOWING THIS ONE.
:2695 ;--
:2696 ;*****
:2697 ;=0
U 106A, 0018,0039,0D80,09F8,0000,1191 :2698 T11E: NEWTST[.3]
U 106B, 0818,0038,5180,0800,0000,1315 :2699 D_K[.1E] ; SET LOOP COUNT TO -2E(16)
U 1315, 0000,003C,6580,0800,0000,1316 :2700 KMX/.10
U 1316, 0019,0014,6580,09E0,0000,1317 :2701 RC[OC]_D+K[.10] ;
U 1317, 0018,0038,A580,0A80,0000,106C :2702 R[O]_K[.60] ; INIT ADDRESS OF EXPECTED DATA
U 106C, 0818,0039,D980,0800,0000,11AA :2703 =0 D_K[.9],CALL,J/DCO ; GEN ADDRESS OF OPCODES
U 106D, 0001,003C,0180,0A88,0000,1318 :2704 R[1]_D ; SAVE
:2705 ;
:2706 ;////////////////////////////////////
:2707 ;+
:2708 ; START THE TEST
:2709 ;--
:2710 ;
:2711 T2S1:
U 1318, 0000,003C,0180,0A00,0200,1319 :2712 T11EL1: VA R[O] ; LOAD ADDRESS OF EXP DATA
U 1319, 0000,803C,0180,C800,0000,131A :2713 D[BYTE]_CACHE.P ; READ EXPECTED DATA
U 131A, 0019,0034,4980,09F0,0000,106E :2714 RC[OE]_D.AND.K[.FF] ; SAVE
U 106E, 0000,003D,0180,0800,0000,11A5 :2715 =0 ERLOOP
U 106F, 0810,0038,0180,0970,0000,1070 :2716 D_RC[OE] ; PUT EXPECTED VALUE IN D REG
U 1070, 2000,003D,0180,0A08,4200,11C5 :2717 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; START THE I BUFFER
U 1071, 1000,003C,0180,0800,0000,1072 :2718 IBC7STOP ; STOP THE I BUFF
U 1072, 0000,003D,0180,0800,0000,11C4 :2719 =0 CALL,J/DISPAT ; EXECUTE THE CALL 3
U 1073, 001D,A000,0180,0800,0010,131B :2720 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE RESULT
U 131B, 0000,013C,0180,0800,0000,1074 :2721 Z? ; BRANCH IF OK
U 1074, 0001,203D,0180,09E8,0000,11A8 :2722 =0 ERROR2,RC[OD]_Q ; OP CODE BRANCHED WRONG
:2723 ;
:2724 ;+
:2725 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
:2726 ;--
:2727 ;
U 1075, 0000,003C,0180,0880,0000,131C :2728 LA RA[O] ; READ ADDRESS OF EXP DATA
U 131C, 0018,0014,0580,0A80,0000,131D :2729 R[O]_LA+K[.1] ; INCREMENT THE ADDRESS
U 131D, 0000,003C,0180,0888,0000,131E :2730 LA RA[1] ; READ ADDRESS OF OP CODES
U 131E, 0018,0014,1180,0A88,0000,131F :2731 R[1]_LA+K[.4] ; INCREMENT TO NEXT OP CODE
U 131F, 0810,0038,0180,0960,0000,1320 :2732 D_RC[OC] ; GET THE LOOP COUNT
U 1320, 0019,8000,0580,09E0,0010,1321 :2733 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 1321, 0000,013C,0180,0800,0000,1076 :2734 Z? ; BRANCH IF FINISHED
U 1076, 0000,003C,0180,0800,0000,1318 :2735 =0 J/T11EL1 ; CONTINUE LOOPING
U 1077, 0000,003C,0180,0800,0000,1078 :2736 NOP
:2737 ;
:2738 ;THE FOLLOWING IS THE EXPECTED ADDRESSES FOR THE ABOVE TEST:
:2739 ;X 60
:2740 ;$ 8E8F,8C8D,8A8B,8889,CE82,CE82,8587,8381,4F4D,444E
:2741 ;$ 4640,C442,84C0,A980,2FAF,2EAE,0604,1F02,0800,0A0C,0B09,0F0D,1B19
:2742 ;
:2743 ;FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
:2744 ;X 90
:2745 ; LOOP COUNT STARTS AT 2E
:2746 ;$ 0000,0000

```

:2747	:\$ 0001,0000	
:2748	:\$ 0002,0000	
:2749	:\$ 0003,0000	
:2750	:\$ 0004,0000	
:2751	:\$ 0005,0000	
:2752	:\$ 0006,0000	
:2753	:\$ 0007,0000	
:2754	:\$ 0010,0000	
:2755	:\$ 0011,0000	
:2756	:\$ 0030,0000	
:2757	:\$ 0031,0000	
:2758	:\$ 0057,0000	
:2759	:\$ 00FD,0000	
:2760	:\$ 00FE,0000	
:2761	:\$ LOOP COUNT	STARTS AT 1F
:2762	:\$ 00FF,0000	
:2763	:\$ 507C,0000	
:2764	:\$ 5094,0000	
:2765	:\$ 50DC,0000	
:2766	:\$ 5040,0050	
:2767	:\$ 0040,0050	
:2768	:\$ 5060,0050	
:2769	:\$ 0060,0050	
:2770	:\$ 5080,0050	
:2771	:\$ 0080,0050	
:2772	:\$ 5091,0050	
:2773	:\$ 0091,0050	
:2774	:\$ 5053,0000	
:2775	:\$ 5095,0000	
:2776	:\$ 5096,0000	
:2777	:\$ 50E8,0000	
:2778	:\$ LOOP COUNT	STARTS AT OF
:2779	:\$ 50F4,0000	
:2780	:\$ 5044,0050	
:2781	:\$ 5064,0050	
:2782	:\$ 007D,0000	
:2783	:\$ 8F7D,0000	
:2784	:\$ 0090,0060	
:2785	:\$ 6090,0050	
:2786	:\$ 4090,6060	
:2787	:\$ 7090,0050	
:2788	:\$ 8090,0050	
:2789	:\$ 9090,0050	
:2790	:\$ A090,0000	
:2791	:\$ B090,0000	
:2792	:\$ 8F90,0050	
:2793	:\$ 9F90,0050	
:2794		
:2795		

```

:2796 .PAGE 'TEST 11F 'A FORK' BRANCH OPCODES DECODE'
:2797 *****
:2798 ++
:2799 .TEST 11F 'A FORK' BRANCH DECODES
:2800
:2801 .TEST DESCRIPTION
:2802 THIS TEST CHECKS THE BRANCH INSTRUCTION DECODE ON THE A FORK.
:2803 THIS IS DONE BY LOADING THE IB WITH THE OPCODE, LOADING THE
:2804 CONDITION CODES, AND EXECUTING THE SUB/SPEC AND CHECK THE ADDRESS.
:2805 FOLLOWING IS A TABLE OF THE OPCODES, CONDITION CODE VALUES,
:2806 AND EXPECTED A FORK ADDRESS, FOR THIS TEST:
:2807
:2808 INSTR ADDRESS CC'S INSTR ADDRESS CC'S
:2809 -----
:2810
:2811 BGTRU C8 1000 BGEQ C8 0111
:2812 BGEQU C8 0110 BVC C8 1000
:2813 BNEQ C8 0101 BGTR C8 1000
:2814 BGTRU C9 0001 BGTRL C9 0100
:2815 BGEQ C9 1000 BVC C9 0010
:2816 BNEQ CA 0101 BGTR CA 1000
:2817 BEQL CC 0000
:2818
:2819 SUBTST 1 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS C8
:2820 SUBTST 2 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS C9
:2821 SUBTST 3 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS CA
:2822 SUBTST 4 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS CC
:2823 .LOGIC DESCRIPTION
:2824 THIS TEST CHECKS THE VAX DECODE PROMS, THE BRANCH COND 0, 1, AND
:2825 2 SIGNALS, AND THE BRANCH COND INPUTS TO THE DECODE ADDRESS GATES.
:2826
:2827 .ERROR DESCRIPTION
:2828 DATA: EXPECTED MICRO PC BITS <7:0>
:2829 RECEIVED MICRO PC BITS <7:0>
:2830 LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY UNDER TEST,
:2831 (SEE THE DATA TABLE AT THE END OF THIS TEST)
:2832
:2833 .SYNC POINT DESCRIPTION
:2834 ADDRESS SYNC00--MICRO PC BITS ARE VALID AT THE INSTRUCTION FOLLOWING
:2835 THIS ONE.
:2836 --
:2837 *****
:2838 =0
:2839 T11F: NEWTST[.3]
:2840 NOP
:2841 D_K[.1],CALL,J/DC5 ; GEN ADR OF COND CODE DATA
:2842 NOP
:2843 CALL,J/DC0 ;
:2844 R[0]_D ; SAVE
:2845 D_K[.1],CALL,J/DC6 ; GEN ADR OF EXPECTED ADDRESSES
:2846 NOP
:2847 CALL,J/DC0 ;
:2848 R[2]_D ; SAVE
:2849 R[1]_D+K[.4] ; INIT ADDRESS OF OP CODES
:2850 Q_K[.1]

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U 1078, 0018,0039,0D80,09F8,0000,1191
U 1079, 0000,003C,0180,0800,0000,107A
U 107A, 0818,0039,0580,0800,0000,11AF
U 107B, 0000,003C,0180,0800,0000,107C
U 107C, 0000,003D,0180,0800,0000,11AA
U 107D, 0001,003C,0180,0A80,0000,107E
U 107E, 0818,0039,0580,0800,0000,11B0
U 107F, 0000,003C,0180,0800,0000,1080
U 1080, 0000,003D,0180,0800,0000,11AA
U 1081, 0001,003C,0180,0A90,0000,1322
U 1322, 0019,0014,1180,0A88,0000,1323
U 1323, 0018,0038,05C0,0800,0000,1324

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U 1324, 0000,003C,6580,0800,0084,7325 :2851          SC K[.10]          ; GEN MASK
U 1325, 0001,2014,0180,0980,0000,1082 :2852          RC[0]_Q+MASK      ; FOR CC DATA
:2853
:2854 :////////////////////
:2855 :+
:2856 : START THE TEST
:2857 :-
:2858
:2859 =0
U 1082, 0000,003D,0180,0800,0000,11BF :2860 T11FS1: SUBTEST
U 1083, 0018,0038,D580,09E0,0000,1084 :2861          RC[0C]_K[.6]          ; INIT THE LOOP COUNT
U 1084, 0000,003D,0180,0800,0000,11A5 :2862 =0          ERLOOP
U 1085, 0000,003C,0180,0A10,0200,1326 :2863 T11FL1: VA R[2]          ; FETCH EXP ADDRESS
U 1326, 0000,803C,0180,C800,0000,1327 :2864          D[BYTE] CACHE.P      ; ...
U 1327, 0019,0034,4980,09F0,0000,1086 :2865          RC[0E] D.AND.K[.FF]    ; SAVE
U 1086, 2000,003D,0180,0A08,4200,11C5 :2866 =0          ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1087, 0000,003C,0180,0A00,0200,1328 :2867          VA R[0]
U 1328, 0000,803C,0180,C900,0000,1329 :2868          D[BYTE] CACHE.P,LC_RC[0] ; FETCH CC'S
U 1329, 0811,0024,0180,0800,0000,132A :2869          D_D.ANDNOT.LC          ; MASK
U 132A, 0000,003C,3DF0,2C00,0000,132B :2870          Q_ID[PSL]              ; READ THE PSL
U 132B, 0019,2024,61C0,0800,0000,132C :2871          Q_Q.ANDNOT.K[.F]        ; MASK PSL
U 132C, 081D,0030,0180,0800,0000,132D :2872          D_D.OR.Q              ; OR IN CC'S
U 132D, 0810,0038,3D80,3D70,0000,1088 :2873          ID[PSL] D,D RC[0E]      ; LOAD THE CC'S
U 1088, 0000,003D,0180,0800,0000,11C4 :2874 =0          CALL,J/DISPAT        ; EXECUTE THE CALL 3
U 1089, 001D,A000,0180,0800,0010,132E :2875          ALU Q-D,CLK.UBCC,BYTE  ; ADDRESS OK?
U 132E, 0800,013C,0180,0A08,0000,108A :2876          Z?,D R[1]              ; BRANCH IF YES
U 108A, 0001,A03D,0180,09E8,0000,11A8 :2877 =0          ERROR2,RC[0D]_Q,BYTE
U 108B, 0800,003C,0180,0A08,0000,132F :2878          D_R[1]
:2879
:2880 :+
:2881 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2882 :-
:2883
U 132F, 0019,0014,0580,0A88,0000,1330 :2884          R[1] D+K[.1]          ; INCREMENT ADR OF OP CODES
U 1330, 0000,003C,0180,0A00,0000,1331 :2885          LAB R[0]
U 1331, 0018,0014,0580,0A80,0000,1332 :2886          R[0] LA+K[.1]          ; INCREMENT ADR OF CC'S
U 1332, 0810,0038,0180,0960,0000,1333 :2887          D RC[0C]
U 1333, 0019,8000,0580,09E0,0010,1334 :2888          RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 1334, 0000,013C,0180,0800,0000,108C :2889          Z?                    ; BRANCH IF LOOP DONE
U 108C, 0000,003C,0180,0800,0000,1085 :2890 =0          J/T11FL1            ; CONTINUE TESTING
:2891
:2892 :////////////////////
:2893 :+
:2894 : NOW CHECK MICRO ADDRESS C9
:2895 :-
:2896
:2897
U 108D, 0000,003C,0180,0A10,0000,108E :2898 T11FS2: LAB R[2]
U 108E, 0000,003D,0180,0800,0000,11BF :2899 =0          SUBTEST
U 108F, 0018,0014,0580,0A90,0000,1335 :2900          R[2] LA+K[.1]          ; INCREMENT ADR OF EXP ADRS
U 1335, 0018,0038,1180,09E0,0000,1090 :2901          RC[0C]_K[.4]          ; SET LOOP COUNT
U 1090, 0000,003D,0180,0800,0000,11A5 :2902 =0          ERLOOP
U 1091, 0000,003C,0180,0A10,0200,1336 :2903 T11FL2: VA R[2]          ; FETCH EXP ADDRESS
U 1336, 0000,803C,0180,C800,0000,1337 :2904          D[BYTE] CACHE.P      ; ...
U 1337, 0019,0034,4980,09F0,0000,1092 :2905          RC[0E]_D.AND.K[.FF]    ; SAVE

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U 1092, 2000,003D,0180,0A08,4200,11C5 :2906 =0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
U 1093, 0000,003C,0180,0A00,0200,1338 :2907 VA R[0]
U 1338, 0000,803C,0180,C900,0000,1339 :2908 D[BYTE] CACHE.P,LC_RC[0] : FETCH CC'S
U 1339, 0811,0024,0180,0800,0000,133A :2909 D_D.ANDNOT.LC : MASK
U 133A, 0000,003C,3DF0,2C00,0000,133B :2910 Q_ID[PSL] : READ THE PSL
U 133B, 0019,2024,61C0,0800,0000,133C :2911 Q_Q.ANDNOT.K[F] : MASK THE PSL
U 133C, 081D,0030,0180,0800,0000,133D :2912 D_D.OR.Q : INSERT CC'S
U 133D, 0810,0038,3D80,3D70,0000,1094 :2913 ID[PSL] D,D RC[OE] : LOAD THE CC'S
U 1094, 0000,003D,0180,0800,0000,11C4 :2914 =0 CALL,J/DISPAT : EXECUTE THE CALL 3
U 1095, 001D,A000,0180,0800,0010,133E :2915 ALU Q-D,CLK.UBCC,BYTE : ADDRESS OK?
U 133E, 0800,013C,0180,0A08,0000,1096 :2916 Z?,B R[1] : BRANCH IF YES
U 1096, 0001,A03D,0180,09E8,0000,11A8 :2917 =0 ERROR2,RC[OD],Q,BYTE
:2918
:2919 :+
:2920 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2921 :-
:2922
U 1097, 0800,003C,0180,0A08,0000,133F :2923 D R[1]
U 133F, 0019,0014,0580,0A88,0000,1340 :2924 R[1] D+K[.1] : INCREMENT ADR OF OP CODES
U 1340, 0000,003C,0180,0A00,0000,1341 :2925 LAB R[0]
U 1341, 0018,0014,0580,0A80,0000,1342 :2926 R[0] LA+K[.1] : INCREMENT ADR OF CC'S
U 1342, 0810,0038,0180,0960,0000,1343 :2927 D RC[OC]
U 1343, 0019,8000,0580,09E0,0010,1344 :2928 RC[OC]_D-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
U 1344, 0000,013C,0180,0800,0000,1098 :2929 Z? : BRANCH IF LOOP DONE
U 1098, 0000,003C,0180,0800,0000,1091 :2930 =0 J/T11FL2 : CONTINUE TESTING
:2931
:2932
:2933 :////////////////////
:2934 :+
:2935 : NOW CHECK MICRO ADDRESS CA
:2936 :-
:2937
U 1099, 0000,003C,0180,0A10,0000,109A :2938 T11FS3: LAB R[2]
U 109A, 0000,003D,0180,0800,0000,11BF :2939 =0 SUBTEST
U 109B, 0018,0014,0580,0A90,0000,1345 :2940 R[2] LA+K[.1] : INCREMENT ADR OF EXP ADDRESS
U 1345, 0018,0038,0980,09E0,0000,109C :2941 RC[OC]_K[.2] : SET LOOP COUNT
U 109C, 0000,003D,0180,0800,0000,11A5 :2942 =0 ERLOOP
U 109D, 0000,003C,0180,0A10,0200,1346 :2943 T11FL3: VA R[2] : FETCH EXP ADDRESS
U 1346, 0000,803C,0180,C800,0000,1347 :2944 D[BYTE] CACHE.P :
U 1347, 0019,0034,4980,09F0,0000,109E :2945 RC[OE] D.AND.K[FF] : SAVE
U 109E, 2000,003D,0180,0A08,4200,11C5 :2946 =0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
U 109F, 0000,003C,0180,0A00,0200,1348 :2947 VA R[0]
U 1348, 0000,803C,0180,C900,0000,1349 :2948 D[BYTE] CACHE.P,LC_RC[0] : FETCH CC'S
U 1349, 0811,0024,0180,0800,0000,134A :2949 D_D.ANDNOT.LC : MASK
U 134A, 0000,003C,3DF0,2C00,0000,134B :2950 Q_ID[PSL] : READ THE PSL
U 134B, 0019,2024,61C0,0800,0000,134C :2951 Q_Q.ANDNOT.K[F] : MASK THE PSL
U 134C, 081D,0030,0180,0800,0000,134D :2952 D_D.OR.Q : INSERT CC'S
U 134D, 0810,0038,3D80,3D70,0000,10A0 :2953 ID[PSL] D,D RC[OE] : LOAD THE CC'S
U 10A0, 0000,003D,0180,0800,0000,11C4 :2954 =0 CALL,J/DISPAT : EXECUTE THE CALL 3
U 10A1, 001D,A000,0180,0800,0010,134E :2955 ALU Q-D,CLK.UBCC,BYTE : ADDRESS OK?
U 134E, 0800,013C,0180,0A08,0000,10A2 :2956 Z?,B R[1] : BRANCH IF YES
U 10A2, 0001,A03D,0180,09E8,0000,11A8 :2957 =0 ERROR2,RC[OD],Q,BYTE
:2958
:2959 :+
:2960 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST

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:2961 :-
:2962
U 10A3, 0800,003C,0180,0A08,0000,134F :2963 D R[1]
U 134F, 0019,0014,0580,0A88,0000,1350 :2964 R[1],D+K[.1] ; INCREMENT ADR OF OP CODES
U 1350, 0000,003C,0180,0A00,0000,1351 :2965 LAB R[0]
U 1351, 0018,0014,0580,0A80,0000,1352 :2966 R[0],LA+K[.1] ; INCREMENT ADR OF CC'S
U 1352, 0810,0038,0180,0960,0000,1353 :2967 D R[0C]
U 1353, 0019,8000,0580,09E0,0010,1354 :2968 R[0C],D-K[.1],CLK,UBCC,BYTE ; DECREMENT LOOP COUNT
U 1354, 0000,013C,0180,0800,0000,10A4 :2969 Z? ; BRANCH IF LOOP DONE
U 10A4, 0000,003C,0180,0800,0000,109D :2970 =0 J/T11FL3 ; CONTINUE TESTING
:2971
:2972
:2973 :////////////////////
:2974 :+
:2975 : NOW CHECK MICRO ADDRESS CC
:2976 :-
:2977
U 10A5, 0000,003C,0180,0A10,0000,10A6 :2978 T11FS4: LAB R[2]
U 10A6, 0000,003D,0180,0800,0000,118F :2979 =0 SUBTEST
U 10A7, 0018,0014,0580,0A90,0000,10A8 :2980 R[2],LA+K[.1] ; INCREMENT ADR OF EXP ADDRESS
U 10A8, 0000,003D,0180,0800,0000,11A5 :2981 =0 ERLOOP
U 10A9, 0000,003C,0180,0A10,0200,1355 :2982 VA R[2] ; FETCH EXP ADDRESS
U 1355, 0000,803C,0180,C800,0000,1356 :2983 D[BYTE] CACHE.P ;
U 1356, 0019,0034,4980,09F0,0000,10AA :2984 R[0E],D.AND,K[.FF] ; SAVE
U 10AA, 2000,003D,0180,0A08,4200,11C5 :2985 =0 ALU R[1],FLUSH,IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 10AB, 0000,003C,0180,0A00,0200,1357 :2986 VA R[0]
U 1357, 0000,803C,0180,C900,0000,1358 :2987 D[BYTE] CACHE.P,LC,R[0] ; FETCH CC'S
U 1358, 0811,0024,0180,0800,0000,1359 :2988 D,D.ANDNOT,LC ; MASK
U 1359, 0000,003C,3DF0,2C00,0000,135A :2989 Q_ID[PSL] ; READ THE PSL
U 135A, 0019,2024,61C0,0800,0000,135B :2990 Q,Q.ANDNOT,K[.F] ; MASK THE PSL
U 135B, 081D,0030,0180,0800,0000,135C :2991 D,D.OR,Q ; INSERT CC'S
U 135C, 0810,0038,3D80,3D70,0000,10AC :2992 ID[PSL],D,D,R[0E] ; LOAD THE CC'S
U 10AC, 0000,003D,0180,0800,0000,11C4 :2993 =0 CALL,J/DISPAT ; EXECUTE THE CALL 3
U 10AD, 001D,A000,0180,0800,0010,135D :2994 ALU Q-D,CLK,UBCC,BYTE ; ADDRESS OK?
U 135D, 0800,013C,0180,0A08,0000,10AE :2995 Z?,D,R[1] ; BRANCH IF YES
U 10AE, 0001,A03D,0180,09E8,0000,11A6 :2996 =0 ERROR1,R[0D],Q,BYTE ; BRANCH DECODE FAILED
U 10AF, 0000,003C,0180,0800,0000,10B0 :2997 NOP
:2998
:2999
3000
3001 : THE FOLLOWING IS THE CONDITION CODE DATA FOR THE ABOVE TEST:
3002 :X 150
3003 : SUBTEST 1
3004 :$ 0708,0806,0008
3005 : SUBTEST 2
3006 :$ 0401,0208
3007 : SUBTEST 3
3008 :$ 0805
3009 : SUBTEST 4
3010 :$ 0000
3011 :
3012 : THE FOLLOWING IS THE EXP ADDRESS FOR THE ABOVE TEST:
3013 :X 160
3014 :$ C9C8,CCCA
3015 :

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ZZ-ESKAH-V132
ESKAH35.MCR

TEST 11F 'A FORK' BRANCH OPCODES DECODE
MICRO2 1M(01)

C 6

16-DEC-82 12:11:33

SEQ 0887
Page 7

.3016 : THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
.3017 :% 164
.3018 : SUBTEST 1
.3019 :\$ 181A,1C1E,1412
.3020 : SUBTEST 2
.3021 :\$ 1A1A,1C18
.3022 : SUBTEST 3
.3023 :\$ 1412
.3024 : SUBTEST 4
.3025 :\$ 0013
.3026
.3027

ZZ
ES
CCCCCCCCCCCCCCCC
CCCCCCCCCCCCCCCC


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3028 .PAGE "TEST 120 SELECT SPECIFIER LOGIC"
3029 *****
3030 ++
3031 TEST 120 SELECT SPECIFIER LOGIC
3032
3033 TEST DESCRIPTION
3034 THIS TEST CHECKS THE LOGIC THAT GENERATES THE DECODE ADDRESS
3035 WHEN THE OPCODE REQUIRES A SELECT SPECIFIER DECODE RATHER THAN
3036 AN EXECUTE DECODE. THIS IS DONE BY LOADING THE IB WITH THE OPCODE,
3037 EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
3038
3039 SUBTST 1 - CHECK THOSE OPCODES THAT CAN BE TESTED AT EXECUTION
3040 POINT 0
3041 SUBTST 2 - CHECK THOSE OPCODES THAT REQUIRE THE EXECUTION POINT
3042 COUNTER TO BE AT 1.
3043
3044 LOGIC DESCRIPTION
3045 THIS TEST CHECKS THE LOGIC THAT DRIVES THE SELECT SPECIFIER INPUTS
3046 TO THE DECODE ADDRESS GATES ON THE IFC MODULE.
3047
3048 ERROR DESCRIPTION
3049 DATA: EXPECTED MICRO PC BITS <7:0>
3050 RECEIVED MICRO PC BITS <7:0>
3051 LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
3052 IB. (SEE THE DATA TABLE AT THE END OF THIS TEST).
3053
3054 SYNC POINT DESCRIPTION
3055 ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION FOLLOWING
3056 THIS ONE.
3057 --
3058 *****
3059 =0
3060 T120: NEWTST[.3]
3061 NOP
3062 =0 D K[.18],CALL,J/DC0 ; GEN ADR OF IB DATA
3063 R[1]_D ; SAVE
3064 =0 D K[.3],CALL,J/DC2 ; GEN ADR OF EXPECTED ADDRESSES
3065 NOP
3066 =0 CALL,J/DC0 ; --
3067 R[0]_D ; SAVE
3068
3069 ;////////////////////////////////////
3070 ;+
3071 ; CHECK THOSE OPCODES AND SPECIFIERS THAT REQUIRE THE EP COUNTER TO BE 0
3072 ;-
3073
3074 =0
3075 T120S1: SUBTEST
3076 D K[.30] ; SET THE LOOP COUNT
3077 KMX/.6
3078 RC[0C] D+K[.6] ; EQUALS 36(16)
3079 T120L1: VA R[0] ; LOAD ADDRESS OF EXPECTED ADDRESS
3080 D[BYTE] CACHE.P ; READ IT
3081 RC[0E] D.AND.K[.FF] ; SAVE
3082 =0 ERLOOP

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U 10B0, 0018,0039,0D80,09F8,0000,1191

U 10B1, 0000,003C,0180,0800,0000,10B2

U 10B2, 0818,0039,7D80,0800,0000,11AA

U 10B3, 0001,003C,0180,0A88,0000,10B4

U 10B4, 0818,0039,0D80,0800,0000,11AC

U 10B5, 0000,003C,0180,0800,0000,10B6

U 10B6, 0000,003D,0180,0800,0000,11AA

U 10B7, 0001,003C,0180,0A80,0000,10B8

U 10B8, 0000,003D,0180,0800,0000,11BF

U 10B9, 0818,0038,7980,0800,0000,135E

U 135E, 0000,003C,D580,0800,0000,135F

U 135F, 0019,0014,D580,09E0,0000,1360

U 1360, 0000,003C,0180,0A00,0200,1361

U 1361, 0000,803C,0180,C800,0000,1362

U 1362, 0019,0034,4980,09F0,0000,10BA

U 10BA, 0000,003D,0180,0800,0000,11A5

U 10BB.	0810,0038,0180,0970,0000,10BC	:3083
U 10BC.	2000,003D,0180,0A08,4200,11C5	:3084
U 10BD.	0000,003C,0180,0800,0000,10BE	:3085
U 10BE.	0000,003D,0180,0800,0000,11C4	:3086
U 10BF.	001D,A000,0180,0800,0010,1363	:3087
U 1363.	0800,013C,0180,0A08,0000,10C0	:3088
U 10C0.	0001,A03D,0180,09E8,0000,11A8	:3089
U 10C1.	0800,003C,0180,0A08,0000,1364	:3090
U 1364.	0019,0014,1180,0A88,0000,1365	:3091
U 1365.	0000,003C,0180,0A00,0000,1366	:3092
U 1366.	0018,0014,0580,0A80,0000,1367	:3093
U 1367.	0810,0038,0180,0960,0000,1368	:3094
U 1368.	0019,8000,0580,09E0,0010,1369	:3095
U 1369.	0000,013C,0180,0800,0000,10C2	:3096
U 10C2.	0000,003C,0180,0800,0000,1360	:3097

```

D RC[OE] ; GET EXP ADDRESS
=0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
NOP
=0 CALL,J/DISPAT ; EXECUTE THE CALL 3
ALU_Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
Z?,D RC[1] ; BRANCH IF YES
=0 ERROR2,RC[OD],Q,BYTE ; ERROR
D RC[1]
RC[1],D+K[.4] ; INCREMENT ADDRESS OF IB DATA
LAB R[0]
RC[0],LA+K[.1] ; INCREMENT ADR OF EXP ADDRESS
D RC[OC]
RC[OC],D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP CNT AND CHECK
Z? ; BRANCH IF DONE
=0 J/T120L1

```

:/

: CHECK THOSE SPECIFIERS THAT REQUIRE THE EP COUNTER TO BE AT 1

U 10C3.	0818,0038,6580,0800,0000,136A	:3104
U 136A.	0019,0014,0980,09E0,0000,10C4	:3105
U 10C4.	0000,003D,0180,0800,0000,11BF	:3106
U 10C5.	0000,003C,0180,0A00,0200,136B	:3107
U 136B.	0000,803C,0180,C800,0000,136C	:3108
U 136C.	0019,0034,4980,09F0,0000,10C6	:3109
U 10C6.	0000,003D,0180,0800,0000,11A5	:3110
U 10C7.	0810,0038,0180,0970,0000,10C8	:3111
U 10C8.	2000,003D,0180,0A08,4200,11C5	:3112
U 10C9.	D000,003C,0180,0800,0000,10CA	:3113
U 10CA.	0000,003D,0180,0800,0000,11C4	:3114
U 10CB.	001D,A000,0180,0800,0010,136D	:3115
U 136D.	0800,013C,0180,0A08,0000,10CC	:3116
U 10CC.	0001,A03D,0180,09E8,0000,11A8	:3117
U 10CD.	0800,003C,0180,0A08,0000,136E	:3118
U 136E.	0019,0014,1180,0A88,0000,136F	:3119
U 136F.	0000,003C,0180,0A00,0000,1370	:3120
U 1370.	0018,0014,0580,0A80,0000,1371	:3121
U 1371.	0810,0038,0180,0960,0000,1372	:3122
U 1372.	0019,8000,0580,09E0,0010,1373	:3123
U 1373.	0000,013C,0180,0800,0000,10CE	:3124
U 10CE.	0000,003C,0180,0800,0000,10C5	:3125
U 10CF.	0000,003C,0180,0800,0000,10D0	:3126

```

T120S2: D K[.10]
          R[OC] D+K[.2] ; SET THE LOOP COUNT
=0 SUBTEST
T120L2: VA R[0] ; LOAD ADDRESS OF EXPECTED ADDRESS
        D[BYTE] CACHE.P ; READ IT
        RC[OE]_D.AND.K[.FF] ; SAVE
=0 ERLOOP
        D RC[OE] ; GET EXP ADDRESS
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
        IBC7CLR.1 ; GO TO EXECT PNT 1
=0 CALL,J/DISPAT ; EXECUTE THE CALL 3
        ALU Q-D,CLK.UBCC,BYTE ; ADDRESS OK?
=0 Z?,D R[1] ; BRANCH IF YES
        ERROR2,RC[OD]_Q,BYTE ; ERROR
        D R[1]
        R[1] D+K[.4] ; INCREMENT ADDRESS OF IB DATA
        LAB R[0]
        R[0] LA+K[.1] ; INCREMENT ADR OF EXP ADDRESS
        D RC[OC]
        RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP CNT AND CHECK
=0 Z? ; BRANCH IF DONE
        J/T120L2
        NOP

```

; THE FOLLOWING IS THE IB DATA FOR TEST 1A:

```

: 180
: SUBTEST 1, LOOP COUNT STARTS AT 36
: $ 1041,0000
: $ 4016,0000
: $ 1016,0000
: $ C016,0000
: $ 3F84,0000
: $ 5084,0000

```

```
3138 :$ 6064.0000
3139 : SUBTEST 1, LOOP COUNT STARTS AT 2F
3140 :$ 8084.0000
3141 :$ 00A4.0000
3142 :$ 00C4.0000
3143 :$ 7084.0000
3144 :$ 9084.0000
3145 :$ 8F64.0000
3146 :$ 2064.0000
3147 :$ 6F64.0000
3148 :$ 2084.0000
3149 :$ 8FA4.0000
3150 :$ 8FC4.0000
3151 :$ 9F64.0000
3152 :$ 8E64.0000
3153 :$ 8D64.0000
3154 :$ 8B64.0000
3155 :$ 8764.0000
3156 : SUBTEST 1, LOOP COUNT STARTS AT 1F
3157 :$ 4084.0000
3158 :$ A084.0000
3159 :$ 8F64.0000
3160 :$ B084.0000
3161 :$ CF64.0000
3162 :$ 6094.0000
3163 :$ 6090.0050
3164 :$ 5090.0060
3165 :$ 5084.0050
3166 :$ 50D9.0050
3167 :$ 5090.0050
3168 :$ 5091.0050
3169 :$ 0090.0050
3170 :$ 5040.0050
3171 :$ 5084.0050
3172 :$ 0F90.0000
3173 : SUBTEST 1, LOOP COUNT STARTS AT 0F
3174 :$ 0F7D.0000
3175 :$ 5F90.0000
3176 :$ 6F90.0000
3177 :$ 7F90.0000
3178 :$ 5F7D.0000
3179 :$ 6F7D.0000
3180 :$ 7F7D.0000
3181 :$ 0016.0000
3182 :$ 0F16.0000
3183 :$ 007E.0000
3184 :$ 0F7E.0000
3185 :$ 007C.0000
3186 :$ 0F7C.0000
3187 :$ 0096.0000
3188 :$ 0F96.0000
3189 :
3190 : SUBTEST 2, LOOP COUNT STARTS AT 12
3191 :$ 4016.0070
3192 :$ 4084.0040
```

CCCCCCCCCCCCCCCC

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```
.3193 :$ 4084,0020
.3194 : SUBTEST 2, LOOP COUNT STARTS AT OF
.3195 :$ 00E0,0020
.3196 :$ 003E,0000
.3197 :$ 503E,0050
.3198 :$ 5041,5050
.3199 :$ 4090,5050
.3200 :$ 0094,0000
.3201 :$ 0F94,0000
.3202 :$ 4090,0050
.3203 :$ 4090,005F
.3204 :$ 407D,0050
.3205 :$ 407D,005F
.3206 :$ 4090,0020
.3207 :$ 407D,0020
.3208 :$ 4090,006F
.3209 :$ 4090,007F
.3210 :
.3211 : THE FOLLOWING IS THE EXPECTED ADDRESS FOR TEST 1A:
.3212 :X 320
.3213 :$ 0C00,0D01,0400,0908,0000,0B0A,021F,0018,1919,091B,0909,0C09,1F0D
.3214 :$ 0D0F,084F,0404,C4C4,C084,0444
.3215 :
.3216 :$ 0200,1814,161A,1A18,0101,0303,4D4D,0101
.3217 :
.3218 :$ 1D0A,0101,2401,1544
.3219 :
.3220 :$ 0101,1515,1717,0301,1A18
.3221 :
```



```

3222 .PAGE 'TEST 121 'B FORK' OPCODE DECODES'
3223 .*****
3224 .++
3225 .TEST 121 'B FORK' OP CODE DECODES
3226 .
3227 .TEST DESCRIPTION
3228 .THIS TEST EXECUTES ALL THE OPCODES THAT HAVE ENTRY POINTS ON THE
3229 .B FORK. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
3230 .A CLR BYTE 1 TO ADVANCE THE EP COUNTER TO EP 1, EXECUTING THE
3231 .SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
3232 .FOLLOWING IS A TABLE OF THE OPCODES AND EXPECTED ADDRESS FOR THIS
3233 .TEST.
3234 .
3235 .      INSTR      ADDRESS      INSTR      ADDRESS
3236 .      -----      -----      -----      -----
3237 .
3238 .      CVTWL      4C      CVTWB      4B
3239 .      MOVZWL      4A      PUSHAW     48
3240 .      ADDF2       2F      CVTFE      45
3241 .      CVTBF       4F      MOVF       85
3242 .      TSTF        8D      CVTFD      47
3243 .      CVTDB       43      ADDD2      2E
3244 .      ADDB2       27      CMPB       AF
3245 .      CVTBD       CC      CVTDF      CD
3246 .      MNEGB      49      MOVD       41
3247 .      TSTB        4D      INCB       4E
3248 .      BBS         A8      AOBLS      23
3249 .      BLBS        CF      SOBGEQ     CE
3250 .      BISPSW      BB      POPR       8A
3251 .      PUSHR       89      CHMK       88
3252 .      MFPR        C7      ADDF3      44
3253 .      ADDF3       40      ADDD3      46
3254 .      ADDD3       42      BICW3      C4
3255 .      BICW3       C0      JMP        8E
3256 .      JSB         8F      REMQUE     84
3257 .
3258 .LOGIC DESCRIPTION
3259 .THIS TEST CHECKS MORE OF THE VAX DECODE ROMS ON THE IRC MODULE.
3260 .
3261 .ERROR DESCRIPTION
3262 .DATA: EXPECTED MICRO PC BITS <7:0>
3263 .      RECEIVED MICRO PC BITS <7:0>
3264 .      LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
3265 .      IB, I.E. DC=CVTWL, DD=CVTWB, DE=MOVZWL, DF=PUSHAW, ETC.
3266 .
3267 .SYNC POINT DESCRIPTION
3268 .ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
3269 .      FOLLOWING THIS ONE.
3270 .
3271 .*****
3272 .=0
3273 .T121: NEWTST[.3]
3274 .      D_K[.D]
3275 .      CALL,J/DCC
3276 .      RC[OC]_D
          ; GEN LOOP COUNT= DC(16)

```

U 10D0, 0018,0039,0D80,09F8,0000,1191
U 10D1, 0818,0038,8980,0800,0000,10D2
U 10D2, 0000,003D,0180,0800,0000,11B6
U 10D3, 0001,003C,0180,09E0,0000,10D4

```

U 10D4, 0818,0039,0D80,0800,0000,11B1 :3277 =0 D K[.3],CALL,J/DC7 ; GEN ADR OF EXP DATA
U 10D5, 0000,003C,0180,0800,0000,10D6 :3278 NOP ;
U 10D6, 0000,003D,0180,0800,0000,11B2 :3279 =0 CALL,J/DC8 ; EQUALS 378(16)
U 10D7, 0001,003C,0180,0A80,0000,10D8 :3280 RC[0]_D ; SAVE
U 10D8, 0818,0039,0D80,0800,0000,11B4 :3281 =0 D K[.3],CALL,J/DCA ; GEN ADR OF IB DATA
U 10D9, 0000,003C,0180,0800,0000,10DA :3282 NOP ;
U 10DA, 0000,003D,0180,0800,0000,11AA :3283 =0 CALL,J/DC0 ;
U 10DB, 0001,003C,0180,0A88,0000,1374 :3284 RC[1]_D ; SAVE
:3285
:3286 :////////////////////
:3287 :+
:3288 : START THE TEST
:3289 :-
:3290
:3291 T121S1:
:3292 T121L1: VA RC[0] ; LOAD ADDRESS OF EXPECTED DATA
:3293 D[BYTE] CACHE.P ; READ THE EXPECTED DATA
:3294 RC[0E]_D.AND.K[.FF] ; SAVE
:3295 =0 ERLOOP
:3296 D RC[0E] ; PUT EXPECTED VALUE IN D REG
:3297 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; START THE I BUFFER
:3298 IBCTCLR.1 ; ADVANCE THE EXECUTION POINT COUNTER
:3299 =0 CALL,J/DISPAT ; GO TO THE B FORK
:3300 ALU_Q-D,CLK.UBCC,BYTE ; IS THE ADDRESS OK?
:3301 Z? ; BRANCH IF YES
:3302 =0 ERROR2,RC[0D]_Q,BYTE ; B FORK FAILED
:3303
:3304 LA RA[0] ; READ ADDRESS OF EXP DATA
:3305 RC[0] LA+K[.1] ; INCREMENT THE ADDRESS
:3306 LA RA[1] ; READ ADDRESS OF OP CODES
:3307 RC[1] LA+K[.4] ; INCREMENT TO NEXT OP CODE
:3308 D RC[0C] ; GET THE LOOP COUNT
:3309 RC[0C]_D+K[.1],CLK.UBCC,BYTE ; INCREMENT LOOP COUNT
:3310 Z? ; BRANCH IF FINISHED
:3311 =0 J/T121L1 ; CONTINUE LOOPING
:3312 NOP
:3313
:3314 :THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:3315 :X 378
:3316 :$ 4B4C,484A,452F,854F,478D,2E43,AF27,CDCC,4149
:3317 :$ 4E4D,23A8,CECF,8A8B,8889,44C7,4640,C442,8EC0,848F
:3318
:3319 :THE FOLLOWING ARE THE OP CODE FOR THE ABOVE TEST:
:3320 :X 3A0
:3321 : LOOP COUNT STARTS AT DC
:3322 :$ 5032,0050
:3323 :$ 5033,0050
:3324 :$ 503C,0050
:3325 :$ 603F,0000
:3326 : LOOP COUNT STARTS AT E0
:3327 :$ 6040,0050
:3328 :$ 5048,0050
:3329 :$ 504C,0050
:3330 :$ 5050,0050
:3331 :$ 6053,0000

```

:3332	:\$ 5056,0050
:3333	:\$ 5068,0050
:3334	:\$ 6060,0050
:3335	:\$ 6080,0050
:3336	:\$ 6091,0050
:3337	:\$ 506C,0050
:3338	:\$ 5076,0050
:3339	:\$ 608E,0050
:3340	:\$ 5070,0050
:3341	:\$ 6095,0000
:3342	:\$ 6096,0000
:3343	LOOP COUNT STARTS AT FO
:3344	:\$ 50E0,0050
:3345	:\$ 50F2,0050
:3346	:\$ 60E8,0000
:3347	:\$ 60F4,0000
:3348	:\$ 50B8,0000
:3349	:\$ 50BA,0000
:3350	:\$ 50BB,0000
:3351	:\$ 50BC,0000
:3352	:\$ 50DB,0050
:3353	:\$ 6041,5050
:3354	:\$ 6041,5000
:3355	:\$ 6061,5050
:3356	:\$ 6061,5000
:3357	:\$ 60AB,5050
:3358	:\$ 60AB,5000
:3359	:\$ 6017,0000
:3360	:\$ 6016,0000
:3361	:\$ 500F,0050
:3362	
:3363	

```

:3364 .PAGE 'TEST 122' 'C FORK' OPCODE DECODES'
:3365 .*****
:3366 .++
:3367 .TEST 122 'C FORK' OP CODE DECODES
:3368 .
:3369 .TEST DESCRIPTION
:3370 .THIS TEST CHECKS ALL THE OPCODES THAT HAVE ENTRY POINTS ON THE
:3371 .C FORK. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
:3372 .TWO CLR BYTE 1'S, EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING
:3373 .THE ADDRESS.
:3374 .FOLLOWING IS A TABLE OF THE OPCODES AND THE EXPECTED ADDRESSES
:3375 .FOR THIS TEST:
:3376 .
:3377 .      INSTR      ADDRESS      INSTR      ADDRESS
:3378 .      -----      -----      -----      -----
:3379 .
:3380 .      CRC        CO        PROBER    CE
:3381 .      INSQUE    CF        REMQUE    01
:3382 .      ADDN6     CA        SUBNC     CA
:3383 .      MULN       CB        DIVN      CD
:3384 .      MOVTC     C3        MOVTUC   C3
:3385 .      CVTNL     40        EDITN    C6
:3386 .      ACBW      C4        ADDF2    8E
:3387 .      MULF2     8F        DIVF2    8D
:3388 .      ACBF      C5        CMPF     C1
:3389 .      EMOF      C8        POLYF    87
:3390 .      ADDD2     8A        MULD2    8C
:3391 .      DIVD2     8B        ACBD     84
:3392 .      CMPD      82        EMODD    86
:3393 .      POLYD     85        ASHL     4C
:3394 .      ASHQ      43        EMUL     89
:3395 .      EDIV      88        ADDB2    4B
:3396 .      ADDB3     4A        MULB2    81
:3397 .      DIVB2     80        CASEB    83
:3398 .      CMPB      49        ROTL     4D
:3399 .      CASEL     0E        MTPR     47
:3400 .      RBS       45        EXTZV    4E
:3401 .      INSV      48        AOBLS    46
:3402 .      CVTLB     86        CVTLN    42
:3403 .      CALLG     4F
:3404 .
:3405 .LOGIC DESCRIPTION
:3406 .THIS TEST CHECKS MORE OF THE VAX DECODE PROMS
:3407 .
:3408 .ERROR DESCRIPTION
:3409 .DATA: EXPECTED MICRO PC BITS <7:0>
:3410 .      RECEIVED MICRO PC BITS <7:0>
:3411 .      LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE IB
:3412 .      I.E. D1=CRC, D2=PROBER, D3=INSQUE, D4=REMQUE, ETC.
:3413 .
:3414 .SYNC POINT DESCRIPTION
:3415 .      ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
:3416 .      FOLLOWING THIS ONE.
:3417 .--
:3418 .*****

```



```

U 10E6, 0018,0039,0D80,09F8,0000,1191 :3419
U 10E7, 0818,0038,7580,0800,0000,137E :3420
U 137E, 081F,2000,6180,0800,0000,137F :3421
U 137F, 0019,0000,6180,09E0,0000,10E8 :3422
U 10E8, 0818,0039,1180,0800,0000,11AD :3423
U 10E9, 0000,003C,0180,0800,0000,10EA :3424
U 10EA, 0000,003D,0180,0800,0000,11B2 :3425
U 10EB, 0001,003C,0180,0A80,0000,10EC :3426
U 10EC, 0818,0039,1180,0800,0000,11B0 :3427
U 10ED, 0000,003C,0180,0800,0000,10EE :3428
U 10EE, 0000,003D,0180,0800,0000,11B2 :3429
U 10EF, 0001,003C,0180,0A88,0000,1380 :3430

:3431
:3432
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:3435
:3436
:3437
:3438
:3439
:3440
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:3462
:3463
:3464
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:3468
:3469
:3470
:3471
:3472
:3473

T122: NEWTST[.3]
D_K[.20]
D_O-D_KMX/.F
RC[OC] D-K[.F]
D_K[.4],CALL,J/DC3
NOP
CALL,J/DC8
RC[0]_D
D_K[.4],CALL,J/DC6
NOP
CALL,J/DC8
RC[1]_D

: SET THE LOOP COUNT -47(10)
: GEN ADR OF EXPECTED DATA
: EQUALS 438
: GEN ADR OF IB DATA
: SAVE

:////////////////////
:
: START THE TEST
:-

T122S1:
T122L1: VA RC[0]
D[BYTE] CACHE.P
RC[OE]_D.AND.K[.FF]
ERLOOP
D_RC[OE]
ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT
IBC7CLR.1
IBC/CLR.1
CALL,J/DISPAT
ALU_Q-D,CLK.UBCC,BYTE
Z?
ERROR2,RC[OD]_Q,BYTE
LA RA[0]
RC[0]_LA+K[.1]
LA RA[1]
RC[1]_LA+K[.8]
D_RC[OC]
RC[OC]_D+K[.1],CLK.UBCC,BYTE
Z?
J/T122L1
NOP

: LOAD ADDRESS OF EXPECTED DATA
: READ THE EXPECTED DATA
: SAVE
: PUT EXPECTED VALUE IN D REG
: START THE IB
: ADVANCE THE EXECUTION POINT COUNTER
: ADVANCE THE EXECUTION POINT COUNTER
: EXECUTE THE C FORK
: CHECK THE ADDRESS
: BRANCH IF OK
: C FORK FAILED
: READ ADDRESS OF EXP DATA
: INCREMENT THE ADDRESS
: READ ADDRESS OF OP CODES
: INCREMENT TO NEXT OP CODE
: GET THE LOOP COUNT
: INCREMENT LOOP COUNT
: BRANCH IF FINISHED
: CONTINUE LOOPING

:THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:Z 438
:$ CEC0,01CF,CACA,CDCB,C3C3,C640,8EC4,8D8F,C1C5,87C8
:$ 8C8A,848B,8682,4C85,8943,4B88,814A,8380,4D49,470E,4E45
:$ 4648,4286,004F

:THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
:Z 468
: LOOP COUNT STARTS AT D1
:$ 600B,5050,5060,0000
:$ 500C,6050,0000,0000

```

```
:3474 :$ 600E,0060,0000,0000
:3475 :$ 600F,0050,0000,0000
:3476 :$ 6021,6050,6050,0050
:3477 :$ 6023,6050,6050,0050
:3478 :$ 6025,6050,6050,0050
:3479 :$ 6027,6050,6050,0050
:3480 :$ 602E,6050,6050,0050
:3481 :$ 602F,6050,6050,0050
:3482 :$ 5036,5060,0000,0000
:3483 :$ 5038,5060,5060,0060
:3484 :$ 503D,5050,0000,0000
:3485 :$ 6040,0060,0000,0000
:3486 :$ 5044,0050,0000,0000
:3487 : LOOP COUNT STARTS AT E0
:3488 :$ 5046,0050,0000,0000
:3489 :$ 504F,5050,0000,0000
:3490 :$ 5051,0050,0000,0000
:3491 :$ 5054,5050,5050,0000
:3492 :$ 5055,6050,0050,0000
:3493 :$ 6060,0060,0000,0000
:3494 :$ 5064,0050,0000,0000
:3495 :$ 5066,0050,0000,0000
:3496 :$ 506F,5050,0000,0000
:3497 :$ 5071,0050,0000,0000
:3498 :$ 5074,5050,5050,0000
:3499 :$ 5075,6050,0050,0000
:3500 :$ 5078,5050,0000,0000
:3501 :$ 5079,5050,0000,0000
:3502 :$ 507A,5050,0050,0000
:3503 :$ 507B,5050,0050,0000
:3504 : LOOP COUNT STARTS AT F0
:3505 :$ 6080,0060,0000,0000
:3506 :$ 5081,5060,0000,0000
:3507 :$ 5084,0050,0000,0000
:3508 :$ 5086,0050,0000,0000
:3509 :$ 508F,5050,0000,0000
:3510 :$ 6091,0060,0000,0000
:3511 :$ 509C,5050,0000,0000
:3512 :$ 50CF,5050,0000,0000
:3513 :$ 50DA,0050,0000,0000
:3514 :$ 50E0,0060,0000,0000
:3515 :$ 50EF,5050,0050,0000
:3516 :$ 50F0,5050,0050,0000
:3517 :$ 50F2,0060,0000,0000
:3518 :$ 50F6,0050,0000,0000
:3519 :$ 50F9,6050,0000,0000
:3520 :$ 60FA,0060,0000,0000
:3521
:3522
```

```

:3523 .PAGE "TEST 123 D MUX SELECT AND DATA INTEGRITY"
:3524 *****
:3525 ++
:3526 TEST 123 D MUX SELECT AND DATA INTEGRITY
:3527
:3528 TEST DESCRIPTION
:3529 THIS TEST CHECKS THE FUNCTIONALITY OF THE D MULTIPLEXOR BY LOADING
:3530 THE IB WITH AN OPCODE FOLLOWED BY A SPECIFIC DATA PATTERN AND READING
:3531 THE D MUX OUTPUT AND CHECKING IT.
:3532 THE DESCRIPTION AT THE BEGINNING OF EACH SUBTEST SHOWS THE LOGIC
:3533 EQUATION FOR THE TEST CONDITON BEING INVOKED.
:3534
:3535 SUBTST 1 - BYTE 0 SEL=0, BYTE 1 SEL=0, BYTE 23 SEL=0
:3536 SUBTST 2 - BYTE 0 SEL=1, BYTE 1 SEL=0, BYTE 23 SEL=0
:3537 SUBTST 3 - BYTE 0 SEL=2, BYTE 1 SEL=0, BYTE 23 SEL=0
:3538 SUBTST 4 - BYTE 0 SEL=1, BYTE 2 SEL=1, BYTE 23 SEL=0
:3539 SUBTST 5 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=0
:3540 SUBTST 6 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=1
:3541 SUBTST 7 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=0
:3542 SUBTST 8 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=1
:3543 SUBTST 9 - BYTE 0 SEL=3, BYTE 1 SEL=3, BYTE 23 SEL=0
:3544
:3545 LOGIC DESCRIPTION
:3546 THIS TEST CHECKS THE LOGIC THAT GENERATES THE D MULTIPLEXOR
:3547 SELECT LINES ON THE IDP AND IRC MODULES, AND THE D MULTIPLEXOR
:3548 ITSELF ON THE IDP MODULE.
:3549
:3550 ERROR DESCRIPTION
:3551 DATA: EXPECTED D MUX OUTPUT
:3552 RECEIVED D MUX OUTPUT
:3553
:3554 SYNC POINT DESCRIPTION
:3555 SUBTST 1 - SYNC07--D MUX IS READ ONTO THE ID BUS
:3556 SUBTST 2 - SYNC08--D MUX IS READ ONTO THE ID BUS
:3557 SUBTST 3 - SYNC09--D MUX IS READ ONTO THE ID BUS
:3558 SUBTST 4 - SYNC0A--D MUX IS READ ONTO THE ID BUS
:3559 SUBTST 5 - SYNC0B--D MUX IS READ ONTO THE ID BUS
:3560 SUBTST 6 - SYNC0C--D MUX IS READ ONTO THE ID BUS
:3561 SUBTST 7 - SYNC0D--D MUX IS READ ONTO THE ID BUS
:3562 SUBTST 8 - SYNC0E--D MUX IS READ ONTO THE ID BUS
:3563 SUBTST 9 - SYNC0F--D MUX IS READ ONTO THE ID BUS
:3564 --
:3565 *****
:3566 =0
:3567 T123: NEWTST[.2]
:3568 D_K[.4]
:3569 =0 D=D+K[.1],CALL,J/DCE ; GEN ADR OF IB DATA
:3570 NOP
:3571 =0 CALL,J/DC8 ; ...
:3572 R[1]_D
:3573 =0 D_K[.6],CALL,J/DC5 ; GEN ADR OF EXPECTED DATA
:3574 NOP
:3575 =0 CALL,J/DC8 ; ...
:3576 R[0]_D
:3577

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U 10FA, 0018,0039,0980,09F8,0000,1191
U 10FB, 0818,0038,1180,0800,0000,10FC
U 10FC, 0819,0015,0580,0800,0000,11B8
U 10FD, 0000,003C,0180,0800,0000,10FE
U 10FE, 0000,003D,0180,0800,0000,11B2
U 10FF, 0001,003C,0180,0A88,0000,110A
U 110A, 0818,0039,0580,0800,0000,11AF
U 110B, 0000,003C,0180,0800,0000,1110
U 1110, 0000,003D,0180,0800,0000,11B2
U 1111, 0001,003C,0180,0A80,0000,1112

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:3578 :////////////////////
:3579 :+
:3580 : B0 SEL=00 -BDEST*-SHTLIT*-SEL BYTE*-16BITBDEST*-SEL WORD
:3581 : B1 SEL=00 -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
:3582 : B23=0 -SEL LONG*-PCMODE*(LONG+QUAD)
:3583 :-
:3584 :
:3585 =0
U 1112, 0000,003D,0180,0800,0000,11BF :3586 T123S1: SUBTEST
U 1113, 0018,0038,0980,0A90,0000,138B :3587 R[2] K[.2] : SET LOOP COUNT
U 138B, 0000,003C,0180,0A00,0200,138C :3588 T123L1: VA R[0] : LOAD ADDRESS OF EXP DATA
U 138C, 0000,003C,0180,C800,0000,138D :3589 D[LONG] CACHE.P : READ EXPECTED DATA
U 138D, 0001,003C,0180,09F0,0000,1114 :3590 RC[OE]_D : SAVE
U 1114, 0000,003D,0180,0800,0000,11A5 :3591 =0 ERLOOP-
U 1115, 1810,0038,0180,0970,0000,1116 :3592 D RC[OE],IBC/STOP : GET EXP DATA
U 1116, 2000,003D,0180,0A08,4200,11C5 :3593 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
U 1117, 0000,003C,01F0,2C00,0000,138E :3594 SYNC07: Q IB[IBUF] : READ THE D MUX
U 138E, 001D,2000,0180,0800,0010,138F :3595 ACU Q-D,CLK.UBCC : DATA OK?
U 138F, 0800,013C,D580,0A08,0000,1118 :3596 Z?,D R[1],KMX/.6 : BRANCH IF YES
U 1118, 0001,203D,0180,09E8,0000,11A6 :3597 =0 ERROR1,RC[OD]_Q : D MUX FAILED
U 1119, 0019,0014,D580,0A88,0000,1390 :3598 R[1] D+K[.6] : INCREMENT ADR OF IB DATA
U 1390, 0000,003C,0180,0A00,0000,1391 :3599 LAB R[0]
U 1391, 0018,0014,1180,0A80,0000,1392 :3600 R[0] LA+K[.4] : INCREMENT ADR OF EXP DATA
U 1392, 0000,003C,0180,0A10,0000,1393 :3601 LAB R[2]
U 1393, 0018,8000,0580,0A90,0010,1394 :3602 R[2] LA-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
U 1394, 0000,013C,0180,0800,0000,111A :3603 Z? : BRANCH IF DONE
U 111A, 0000,003C,0180,0800,0000,138B :3604 =0 J/T123L1 : CONTINUE
:3605 :
:3606 :
:3607 :////////////////////
:3608 :+
:3609 : B0 SEL=01 SHTLIT*-SEL BYTE*-16BITBDEST
:3610 : B1 SEL=00 -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
:3611 : B23=0 -SEL LONG*-PCMODE*(LONG+QUAD)
:3612 :-
:3613 :
:3614 T123S2: R[2] K[.2] : SET LOOP COUNT
U 111B, 0018,0038,0980,0A90,0000,111C :3615 =0 SUBTEST
U 111C, 0000,003D,0180,0800,0000,11BF :3616 T123L2: VA R[0] : LOAD ADDRESS OF EXP DATA
U 111D, 0000,003C,0180,0A00,0200,1395 :3617 D[LONG] CACHE.P : READ EXPECTED DATA
U 1395, 0000,003C,0180,C800,0000,1396 :3618 RC[OE]_D : SAVE
U 1396, 0001,003C,0180,09F0,0000,111E :3619 =0 ERLOOP-
U 111E, 0000,003D,0180,0800,0000,11A5 :3620 D RC[OE] : GET EXP DATA
U 111F, 0810,0038,0180,0970,0000,1120 :3621 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
U 1120, 2000,003D,0180,0A08,4200,11C5 :3622 SYNC08: Q IB[IBUF] : READ THE D MUX
U 1121, 0000,003C,01F0,2C00,0000,1397 :3623 ACU Q-D,CLK.UBCC : DATA OK?
U 1397, 001D,2000,0180,0800,0010,1398 :3624 Z?,D R[1],KMX/.6 : BRANCH IF YES
U 1398, 0800,013C,D580,0A08,0000,1122 :3625 =0 ERROR1,RC[OD]_Q : D MUX FAILED
U 1122, 0001,203D,0180,09E8,0000,11A6 :3626 R[1] D+K[.6] : INCREMENT ADR OF IB DATA
U 1123, 0019,0014,D580,0A88,0000,1399 :3627 LAB R[0]
U 1399, 0000,003C,0180,0A00,0000,139A :3628 R[0] LA+K[.4] : INCREMENT ADR OF EXP DATA
U 139A, 0018,0014,1180,0A80,0000,139B :3629 LAB R[2]
U 139B, 0000,003C,0180,0A10,0000,139C :3630 R[2] LA-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
U 139C, 0018,8000,0580,0A90,0010,139D :3631 Z? : BRANCH IF DONE
U 139D, 0000,013C,0180,0800,0000,1124 :3632 =0 J/T123L2 : CONTINUE

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3633
3634
3635 :////////////////////////
3636 :+
3637 : B0 SEL=10 -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
3638 : B1 SEL=00 -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
3639 : B23=0 -SEL LONG*-PCMODE*(LONG+QUAD)
3640 :-
3641
3642 T123S3:
3643 R[2] K[.2] ; SET LOOP COUNT
3644 =0 SUBTEST
3645 T123L3: VA R[0] ; LOAD ADDRESS OF EXP DATA
3646 D[ONG] CACHE.P ; READ EXPECTED DATA
3647 RC[OE]_D ; SAVE
3648 =0 ERLOOP
3649 D RC[OE] ; GET EXP DATA
3650 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
3651 SYNC09: Q ID[IBUF] ; READ THE D MUX
3652 ACU Q-D,CLK.UBCC ; DATA OK?
3653 Z?,D R[1],KMX/.6 ; BRANCH IF YES
3654 =0 ERROR1,RC[OD]_Q ; D MUX FAILED
3655 R[1] D+K[.6] ; INCREMENT ADR OF IB DATA
3656 LAB R[0]
3657 R[0] LA+K[.4] ; INCREMENT ADR OF EXP DATA
3658 LAB R[2]
3659 R[2] LA-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
3660 Z? ; BRANCH IF DONE
3661 =0 J/T123L3 ; CONTINUE
3662
3663 :////////////////////////
3664 :+
3665 : B0 SEL=01 BDEST*SEL BYTE*16BITBDEST
3666 : B1 SEL=01 16BITBDEST*-SEL WORD*-(PCMODE*-BYTE)
3667 : B23=0 -SEL LONG*-PCMODE*(LONG+QUAD)
3668 :-
3669
3670
3671 T123S4:
3672 R[2] K[.2] ; SET LOOP COUNT
3673 =0 SUBTEST
3674 T123L4: VA R[0] ; LOAD ADDRESS OF EXP DATA
3675 D[ONG] CACHE.P ; READ EXPECTED DATA
3676 RC[OE]_D ; SAVE
3677 =0 ERLOOP
3678 D RC[OE] ; GET EXP DATA
3679 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
3680 SYNC0A: Q ID[IBUF] ; READ THE D MUX
3681 ACU Q-D,CLK.UBCC ; DATA OK?
3682 Z?,D R[1],KMX/.6 ; BRANCH IF YES
3683 =0 ERROR1,RC[OD]_Q ; D MUX FAILED
3684 R[1] D+K[.6] ; INCREMENT ADR OF IB DATA
3685 LAB R[0]
3686 R[0] LA+K[.4] ; INCREMENT ADR OF EXP DATA
3687 LAB R[2]

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U 1125, 0018,0038,0980,0A90,0000,1126
 U 1126, 0000,003D,0180,0800,0000,11BF
 U 1127, 0000,003C,0180,0A00,0200,139E
 U 139E, 0000,003C,0180,C800,0000,139F
 U 139F, 0001,003C,0180,09F0,0000,1128
 U 1128, 0000,003D,0180,0800,0000,11A5
 U 1129, 0810,0038,0180,0970,0000,112A
 U 112A, 2000,003D,0180,0A08,4200,11C5
 U 112B, 0000,003C,01F0,2C00,0000,13A0
 U 13A0, 001D,2000,0180,0800,0010,13A1
 U 13A1, 0800,013C,D580,0A08,0000,112C
 U 112C, 0001,203D,0180,09E8,0000,11A6
 U 112D, 0019,0014,D580,0A88,0000,13A2
 U 13A2, 0000,003C,0180,0A00,0000,13A3
 U 13A3, 0018,0014,1180,0A80,0000,13A4
 U 13A4, 0000,003C,0180,0A10,0000,13A5
 U 13A5, 0018,8000,0580,0A90,0010,13A6
 U 13A6, 0000,013C,0180,0800,0000,112E
 U 112E, 0000,003C,0180,0800,0000,1127

U 112F, 0018,0038,0980,0A90,0000,1130
 U 1130, 0000,003D,0180,0800,0000,11BF
 U 1131, 0000,003C,0180,0A00,0200,13A7
 U 13A7, 0000,003C,0180,C800,0000,13A8
 U 13A8, 0001,003C,0180,09F0,0000,1132
 U 1132, 0000,003D,0180,0800,0000,11A5
 U 1133, 0810,0038,0180,0970,0000,1134
 U 1134, 2000,003D,0180,0A08,4200,11C5
 U 1135, 0000,003C,01F0,2C00,0000,13A9
 U 13A9, 001D,2000,0180,0800,0010,13AA
 U 13AA, 0800,013C,D580,0A08,0000,1136
 U 1136, 0001,203D,0180,09E8,0000,11A6
 U 1137, 0019,0014,D580,0A88,0000,13AB
 U 13AB, 0000,003C,0180,0A00,0000,13AC
 U 13AC, 0018,0014,1180,0A80,0000,13AD
 U 13AD, 0000,003C,0180,0A10,0000,13AE

U 13AE, 0018,8000,0580,0A90,0010,13AF :3688
 U 13AF, 0000,013C,0180,0800,0000,1138 :3689
 U 1138, 0000,003C,0180,0800,0000,1131 :3690

=0 R[2]_LA-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
 Z? : BRANCH IF DONE
 J/T123L4 : CONTINUE

////////////////////////////////////

+ B0 SEL=10 -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
 B1 SEL=10 -16BITBDEST*-FP*SHTLIT*SEL WORD
 B23=0 -SEL LONG*-PCMODE*(LONG+QUAD)
 :-

U 1139, 0018,0038,0980,0A90,0000,113A :3701
 U 113A, 0000,003D,0180,0800,0000,11BF :3702
 U 113B, 0000,003C,0180,0A00,0200,13B0 :3703
 U 13B0, 0000,003C,0180,C800,0000,13B1 :3704
 U 13B1, 0001,003C,0180,09F0,0000,113C :3705
 U 113C, 0000,003D,0180,0800,0000,11A5 :3706
 U 113D, 0810,0038,0180,0970,0000,113E :3707
 U 113E, 2000,003D,0180,0A08,4200,11C5 :3708
 U 113F, 0000,003C,01F0,2C00,0000,13B2 :3709
 U 13B2, 001D,2000,0180,0800,0010,13B3 :3710
 U 13B3, 0800,013C,D580,0A08,0000,1140 :3711
 U 1140, 0001,203D,0180,09E8,0000,11A6 :3712
 U 1141, 0019,0014,D580,0A88,0000,13B4 :3713
 U 13B4, 0000,003C,0180,0A00,0000,13B5 :3714
 U 13B5, 0018,0014,1180,0A80,0000,13B6 :3715
 U 13B6, 0000,003C,0180,0A10,0000,13B7 :3716
 U 13B7, 0018,8000,0580,0A90,0010,13B8 :3717
 U 13B8, 0000,013C,0180,0800,0000,1142 :3718
 U 1142, 0000,003C,0180,0800,0000,113B :3719

T123S5: R[2] K[.2] : SET LOOP COUNT
 =0 SUBTEST
 T123L5: VA R[0] : LOAD ADDRESS OF EXP DATA
 D[LONG] CACHE.P : READ EXPECTED DATA
 RC[OE]_D : SAVE
 =0 ERLOOP
 D RC[OE] : GET EXP DATA
 =0 A[U R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
 SYNCOB: Q ID[IBUF] : READ THE D MUX
 A[U Q-D,CLK.UBCC : DATA OK?
 Z?,D R[1],KMX/.6 : BRANCH IF YES
 =0 ERROR1,RC[OD]_Q : D MUX FAILED
 R[1]_D+K[.6] : INCREMENT ADR OF IB DATA
 LAB R[0]
 R[0]_LA+K[.4] : INCREMENT ADR OF EXP DATA
 LAB R[2]
 R[2]_LA-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
 Z? : BRANCH IF DONE
 =0 J/T123L5 : CONTINUE

////////////////////////////////////

+ B0 SEL=10 -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
 B1 SEL=10 -16BITBDEST*-FP*SHTLIT*SEL WORD
 B23=1 SEL LONG
 :-

U 1143, 0018,0038,0980,0A90,0000,1144 :3720
 U 1144, 0000,003D,0180,0800,0000,11BF :3721
 U 1145, 0000,003C,0180,0A00,0200,13B9 :3722
 U 13B9, 0000,003C,0180,C800,0000,13BA :3723
 U 13BA, 0001,003C,0180,09F0,0000,1146 :3724
 U 1146, 0000,003D,0180,0800,0000,11A5 :3725
 U 1147, 0810,0038,0180,0970,0000,1148 :3726
 U 1148, 2000,003D,0180,0A08,4200,11C5 :3727
 U 1149, 0000,003C,01F0,2C00,0000,13BB :3728
 U 13BB, 001D,2000,0180,0800,0010,13BC :3729
 U 13BC, 0800,013C,D580,0A08,0000,114A :3730
 U 114A, 0001,203D,0180,09E8,0000,11A6 :3731
 U 114B, 0019,0014,D580,0A88,0000,13BD :3732

T123S6: R[2] K[.2] : SET LOOP COUNT
 =0 SUBTEST
 T123L6: VA R[0] : LOAD ADDRESS OF EXP DATA
 D[LONG] CACHE.P : READ EXPECTED DATA
 RC[OE]_D : SAVE
 =0 ERLOOP
 D RC[OE] : GET EXP DATA
 =0 A[U R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IBUFFER
 SYNCOC: Q ID[IBUF] : READ THE D MUX
 A[U Q-D,CLK.UBCC : DATA OK?
 Z?,D R[1],KMX/.6 : BRANCH IF YES
 =0 ERROR1,RC[OD]_Q : D MUX FAILED
 R[1]_D+K[.6] : INCREMENT ADR OF IB DATA

```

LAB R[0]
R[0]_LA+K[.4] ; INCREMENT ADR OF EXP DATA
LAB R[2]
R[2]_LA-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z? ; BRANCH IF DONE
=0 J/T123L6 ; CONTINUE

```

```

T123S7: NOP
=0 SUBTEST
T123L7: VA R[0] ; LOAD ADDRESS OF EXP DATA
D[CONG] CACHE.P ; READ EXPECTED DATA
RC[OE]_D ; SAVE
=0 ERLOOP
D RC[OE] ; GET EXP DATA
=0 ACU R[1], FLUSH.IB, CALL, J/IBWAIT ; LOAD THE IBUFFER
SYNCD: Q IB[IBUF] ; READ THE D MUX
ACU Q-D, CLK.UBCC ; DATA OK?
Z?, D R[1], KMx/.6 ; BRANCH IF YES
=0 ERROR1, RC[OD]_Q ; D MUX FAILED
R[1] D+K[.6] ; INCREMENT ADR OF IB DATA
LAB R[0]
R[0] LA+K[.4] ; INCREMENT ADR OF EXP DATA

```

```

T123S8: NOP
=0      SUBTEST
T123L8: VA R[0]          ; LOAD ADDRESS OF EXP DATA
        D[LONG] CACHE.P ; READ EXPECTED DATA
        RC[OE]_D         ; SAVE
=0      ERLOOP
        D RC[OE]         ; GET EXP DATA
=0      ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
SYNCOE: Q IB[IBUF]       ; READ THE D MUX
        ACU Q-D,CLK.UBCC ; DATA OK?
        Z?,D R[1],KMX/.6 ; BRANCH IF YES
=0      ERROR1,RC[OD]_Q   ; D MUX FAILED
        R[1] D+K[.6]     ; INCREMENT ADR OF IB DATA
        LAB R[0]
        R[0] LA+K[.4]    ; INCREMENT ADR OF EXP DATA

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3798
3799
3800
3801
3802
3803
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3808
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:////////////////////////
:
: BO SEL=11  FP*SHTLIT
: B1 SEL=11  FP*SHTLIT
: B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
:-
:
T123S9:      R[2] K[.2]                ; SET LOOP COUNT
=0           SUBTEST
T123L9:      VA R[0]                   ; LOAD ADDRESS OF EXP DATA
            D[LONG] CACHE.P           ; READ EXPECTED DATA
            RC[OE]_D                   ; SAVE
=0           ERLOOP
            D RC[OE]                   ; GET EXP DATA
=0           ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
SYNCOF:      Q ID[IBUF]                 ; READ THE D MUX
            ACU Q-D,CLK.UBCC            ; DATA OK?
=0           Z?,D R[1],KMX/.6           ; BRANCH IF YES
            ERROR1,RC[OD]_Q            ; D MUX FAILED
            R[1] D+K[.6]                ; INCREMENT ADR OF IB DATA
            LAB R[0]
            R[0] LA+K[.4]                ; INCREMENT ADR OF EXP DATA
            LAB R[2]
            R[2]_LA-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
=0           Z?                          ; BRANCH IF DONE
            J/T123L9                    ; CONTINUE
            NOP

: THE FOLLOWING DATA IS THE IBUFFER DATA FOR THE ABOVE TEST:
: X 5E8
:      SUBTEST 1
: $ 5055,8080,FFFF
: $ 50AA,0050,FFFF
:      SUBTEST 2
: $ 15FF,8080,FFFF
: $ 2AFF,8080,FFFF
:      SUBTEST 3
: $ 8F90,0055,FFFF
: $ 8F90,00AA,FFFF
:      SUBTEST 4
: $ AA31,FFAA,FFFF
: $ 5531,FF55,FFFF
:      SUBTEST 5
: $ C090,5555,FFFF
: $ C090,AAAA,FFFF
:      SUBTEST 6
: $ E090,5555,5555
: $ E090,AAAA,AAAA
:      SUBTEST 7
: $ 8FB0,AA55,FFFF
:      SUBTEST 8
: $ 8FD0,AAAA,AAAA

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:3870 .PAGE 'TEST 124 BDEST AND 16 BIT BDEST DECODE'
:3871 *****
:3872 ++
:3873 TEST 124 BDEST AND 16 BIT BDEST DECODE
:3874
:3875 TEST DESCRIPTION
:3876 THIS TEST CHECKS THE OPCODES THAT ASSERT BDEST AND/OR 16 BIT
:3877 BDEST. THIS IS DONE BY LOADING THE IB WITH THE OPCODE AND READING
:3878 THE D MUX TO CHECK IF THE SIGNALS ASSERTED OR NOT.
:3879
:3880 SUBTST 1 - CHECK OPCODES FOR BDEST OR 16 BIT BDEST ON THE
:3881 A FORK.
:3882 SUBTST 2 - CHECK THAT AN IBC CODE OF 7 ASSERTS BDEST.
:3883
:3884 LOGIC DESCRIPTION
:3885 THIS TEST CHECKS THE LOGIC THAT GENERATES THE BDEST AND 16 BIT
:3886 BDEST SIGNALS ON THE IDP MODULE.
:3887
:3888 ERROR DESCRIPTION
:3889 DATA: EXPECTED D MUX DATA
:3890 RECEIVED D MUX DATA
:3891 LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
:3892 IB.
:3893
:3894 SYNC POINT DESCRIPTION
:3895 SUBTST 1 - SYNC10--D MUX IS READ ONTO THE ID BUS
:3896 SUBTST 2 - SYNC11--D MUX IS READ ONTO THE ID BUS
:3897 --
:3898 *****
:3899 =0
U 116A, 0018,0039,0D80,09F8,0000,1191 :3900 T124: NEWTST[.3]
U 116B, 0000,003C,0180,0800,0000,116C :3901 NOP
U 116C, 0818,0039,D580,0800,0000,11B3 :3902 =0 D_K[.6],CALL,J/DC9 ; GEN ADDRESS OF EXPECTED DATA
U 116D, 0000,003C,0180,0800,0000,116E :3903 NOP
U 116E, 0000,003D,0180,0800,0000,11B2 :3904 =0 CALL,J/DC8 ; SAVE
U 116F, 0001,003C,0180,0A80,0000,1170 :3905 R[0]_D ; GEN ADDRESS OF Ibuff DATA
U 1170, 0818,0039,D580,0800,0000,11B7 :3906 =0 D_K[.6],CALL,J/DCD ; SAVE
U 1171, 0000,003C,0180,0800,0000,1172 :3907 NOP
U 1172, 0000,003D,0180,0800,0000,11B2 :3908 =0 CALL,J/DC8 ; SAVE
U 1173, 0001,003C,0180,0A88,0000,13D9 :3909 R[1]_D
:3910
:3911 :////////////////////
:3912 +
:3913 IBC NOT EQUAL TO 7
:3914 -
:3915
U 13D9, 0018,0038,F580,09E0,0000,1174 :3916 T124S1: R[0C]_K[.A] ; SET THE LOOP COUNT
U 1174, 0000,003D,0180,0800,0000,11BF :3917 =0 SUBTEST
U 1175, 0000,003C,0180,0A00,0200,13DA :3918 T124L1: VA R[0] ; LOAD ADDRESS OF EXP DATA
U 13DA, 0000,003C,0180,C800,0000,13DB :3919 D[LONG] CACHE.P ; FETCH THE EXPECTED DATA
U 13DB, 0001,003C,0180,09F0,0000,1176 :3920 R[0E]_D ; SAVE
U 1176, 0000,003D,0180,0800,0000,11A5 :3921 =0 ERLOOP
U 1177, 0810,0038,0180,0970,0000,1178 :3922 D_R[0E] ; GET EXP DATA
U 1178, 2000,003D,0180,0A08,4200,11C5 :3923 =0 A[U R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE Ibuffer
U 1179, 0000,003C,01F0,2C00,0000,13DC :3924 SYNC10: Q_ID[IBUF] ; READ THE DMUX
```

```

U 13DC, 001D,2000,0180,0800,0010,13DD :3925      ALU Q-D,CLK.UBCC      ; DATA OK?
U 13DD, 0000,013C,0180,0A08,0000,117A :3926      Z?,[AB_R[1]      ; BRANCH IF YES
U 117A, 0001,203D,0180,09E8,0000,11A8 :3927      =0      ERROR2,RC[0D]_Q
U 117B, 0000,003C,0180,0A08,0000,13DE :3928      LAB_R[1]
U 13DE, 0018,0014,1180,0A88,0000,13DF :3929      R[1] LA+K[.4]      ; INCREMENT ADR OF IB DATA
U 13DF, 0000,003C,0180,0A00,0000,13E0 :3930      LAB_R[0]
U 13E0, 0018,0014,1180,0A80,0000,13E1 :3931      R[0] LA+K[.4]      ; INCREMENT ADR OF EXP DATA
U 13E1, 0810,0038,0180,0960,0000,13E2 :3932      D_RC[0C]      ; GET THE LOOP COUNT
U 13E2, 0019,8000,0580,09E0,0010,13E3 :3933      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
U 13E3, 0000,013C,0180,0A00,0000,117C :3934      Z?,LAB_R[0]      ; BRANCH IF FINISHED
U 117C, 0000,003C,0180,0800,0000,1175 :3935      =0      J/T124[1]      ; CONTINUE
:3936
:3937
:3938      ;////////////////////
:3939      ;+
:3940      ; IBC EQUALS 7
:3941      ;-
:3942
U 117D, 0018,0038,0580,09E0,0000,117E :3943      T124S2: RC[0C]_K[.6]      ; SET THE LOOP COUNT
U 117E, 0000,003D,0180,0800,0000,11BF :3944      =0      SUBTEST
U 117F, 0000,003C,0180,0A00,0200,13E4 :3945      T124L2: VA_R[0]      ; LOAD ADDRESS OF EXP DATA
U 13E4, 0000,003C,0180,0800,0000,13E5 :3946      D[LONG] CACHE.P      ; FETCH THE EXPECTED DATA
U 13E5, 0001,003C,0180,09F0,0000,1180 :3947      RC[0E]_D      ; SAVE
U 1180, 0000,003D,0180,0800,0000,11A5 :3948      =0      ERLOOP
U 1181, 0810,0038,0180,0970,0000,1182 :3949      D_RC[0E]      ; GET EXP DATA
U 1182, 2000,003D,0180,0A08,4200,11C5 :3950      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1183, 7000,003C,01F0,2C00,0000,13E6 :3951      SYNC11: Q_ID[IBUF],IBC/BDEST ; READ THE DMUX
U 13E6, 001D,2000,0180,0800,0010,13E7 :3952      ALU Q-D,CLK.UBCC      ; DATA OK?
U 13E7, 0000,013C,0180,0A08,0000,1184 :3953      Z?,[AB_R[1]      ; BRANCH IF YES
U 1184, 0001,203D,0180,09E8,0000,11A8 :3954      =0      ERROR2,RC[0D]_Q
U 1185, 0000,003C,0180,0A08,0000,13E8 :3955      LAB_R[1]
U 13E8, 0018,0014,1180,0A88,0000,13E9 :3956      R[1] LA+K[.4]      ; INCREMENT ADR OF IB DATA
U 13E9, 0000,003C,0180,0A00,0000,13EA :3957      LAB_R[0]
U 13EA, 0018,0014,1180,0A80,0000,13EB :3958      R[0] LA+K[.4]      ; INCREMENT ADR OF IBUFFER DATA
U 13EB, 0810,0038,0180,0960,0000,13EC :3959      D_RC[0C]      ; GET THE LOOP COUNT
U 13EC, 0019,8000,0580,09E0,0010,13ED :3960      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
U 13ED, 0000,013C,0180,0A08,0000,1186 :3961      Z?,LAB_R[1]      ; BRANCH IF FINISHED
U 1186, 0000,003C,0180,0800,0000,117F :3962      =0      J/T124[2]      ; CONTINUE
U 1187, 0000,003C,0180,0800,0000,1188 :3963      NOP
:3964      ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:3965      ;% 698
:3966      ;$ FFFF,FFFF
:3967      ;$ 0040,0000
:3968      ;$ 0064,0000
:3969      ;$ 0068,0000
:3970      ;$ 0070,0000
:3971      ;$ 00E0,0000
:3972      ;$ FF60,FFFF
:3973      ;$ AAAA,FFFF
:3974      ;$ 0008,0000
:3975      ;$ 002C,0000
:3976      ;$ 0050,0000
:3977      ;$ 0050,0000
:3978      ;$ 0050,0000
:3979      ;$ 5050,0000
    
```

```

:3980 :$ 5050,0000
:3981 :$ 5050,0000
:3982 :
:3983 : THE FOLLOWING IS THE Ibuff DATA FOR THE ABOVE TEST:
:3984 :% 6D8
:3985 : SUBTEST 1, LOOP COUNT 0A THRU 01
:3986 :$ FF10,0000
:3987 :$ 5020,FFFF
:3988 :$ 5032,FFFF
:3989 :$ 5034,FFFF
:3990 :$ 5038,FFFF
:3991 :$ 5070,FFFF
:3992 :$ 50B0,0000
:3993 :$ AA30,00AA
:3994 :$ 5004,5050
:3995 :$ 5016,5050
:3996 : SUBTEST 2, LOOP COUNT 06 THRU 01
:3997 :$ 50D2,FFFF
:3998 :$ 50D4,FFFF
:3999 :$ 50E0,FFFF
:4000 :$ 5040,FF50
:4001 :$ 5080,FF50
:4002 :$ 50D0,FF50
:4003 :
:4004 :
:4005 :=0
:4006 :T125: NEWTST
:4007 :NOP
:4008 :
:4009 :=0
:4010 :T126: NEWTST
:4011 :NOP
:4012 :ENDTST: NEWTST

```

UU

U

000

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2343=	2344=	2345=	2346=	2354=	2355=	2358=	2359=
U 1010	2360=	2361=	2362=	2363=	2364=	2365=	2367=	2368=
U 1018	2370=	2371=	2377=	2378=	2380=	2381=	2382=	2383=
U 1020	2384=	2385=	2386=	2387=	2389=	2390=	2392=	2393=
U 1028	2443=	2444=	2447=	2448=	2455=	2456=	2464=	2465=
U 1030	2466=	2467=	2468=	2469=	2471=	2477=	2484=	2492=
U 1038	2493=	2494=	2501=	2502=	2503=	2504=	2505=	2506=
U 1040	2508=	2509=	2516=	2524=	2525=	2526=	2532=	2533=
U 1048	2534=	2535=	2537=	2538=	2540=	2541=	1920:	1846
U 1050	2552=	2553=	2566=	2567=	2568=	2569=	2571=	2572=
U 1058	2574=	2575=	1924:	1869	2582=	2590=	1928:	1870
U 1060	2591=	2592=	2600=	2601=	2602=	2603=	2605=	2606=
U 1068	2608=	2609=	2698=	2699=	2703=	2704=	2715=	2716=
U 1070	2717=	2718=	2719=	2720=	2722=	2728=	2735=	2736=
U 1078	2839=	2840=	2841=	2842=	2843=	2844=	2845=	2846=
U 1080	2847=	2848=	2860=	2861=	2862=	2863=	2866=	2867=
U 1088	2874=	2875=	2877=	2878=	2890=	2898=	2899=	2900=
U 1090	2902=	2903=	2906=	2907=	2914=	2915=	2917=	2923=
U 1098	2930=	2938=	2939=	2940=	2942=	2943=	2946=	2947=
U 10A0	2954=	2955=	2957=	2963=	2970=	2978=	2979=	2980=
U 10A8	2981=	2982=	2985=	2986=	2993=	2994=	2996=	2997=
U 10B0	3060=	3061=	3062=	3063=	3064=	3065=	3066=	3067=
U 10B8	3075=	3076=	3082=	3083=	3084=	3085=	3086=	3087=
U 10C0	3089=	3090=	3097=	3104=	3106=	3107=	3110=	3111=
U 10C8	3112=	3113=	3114=	3115=	3117=	3118=	3125=	3126=
U 10D0	3273=	3274=	3275=	3276=	3277=	3278=	3279=	3280=
U 10D8	3281=	3282=	3283=	3284=	3295=	3296=	3297=	3298=
U 10E0	3299=	3300=	3302=	3304=	3311=	3312=	3420=	3421=
U 10E8	3424=	3425=	3426=	3427=	3428=	3429=	3430=	3431=
U 10F0	3442=	3443=	3444=	3445=	3447=	3448=	3450=	3452=
U 10F8	3459=	3460=	3567=	3568=	3569=	3570=	3571=	3572=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1871	3573=	3574=	1840:	1841:	1842:	1843:
U 1110	3575=	3576=	3586=	3587=	3591=	3592=	3593=	3594=
U 1118	3597=	3598=	3604=	3614=	3615=	3616=	3619=	3620=
U 1120	3621=	3622=	3625=	3626=	3632=	3643=	3644=	3645=
U 1128	3648=	3649=	3650=	3651=	3654=	3655=	3661=	3672=
U 1130	3673=	3674=	3677=	3678=	3679=	3680=	3683=	3684=
U 1138	3690=	3701=	3702=	3703=	3706=	3707=	3708=	3709=
U 1140	3712=	3713=	3719=	3730=	3731=	3732=	3735=	3736=
U 1148	3737=	3738=	3741=					

[illegible]

Line Number Index

ESKAH35.MCR

MICRO2

1M(01)

16-DEC-82 12:11:33

M 7

SEQ 0910

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ZZ
ES

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2948	2949	2950	2951	2952	2953	2956	2964
U 1350	2965	2966	2967	2968	2969	2983	2984	2987
U 1358	2988	2989	2990	2991	2992	2995	3077	3078
U 1360	3079	3080	3081	3088	3091	3092	3093	3094
U 1368	3095	3096	3105	3108	3109	3116	3119	3120
U 1370	3121	3122	3123	3124	3292	3293	3294	3301
U 1378	3305	3306	3307	3308	3309	3310	3422	3423
U 1380	3439	3440	3441	3446	3449	3453	3454	3455
U 1388	3456	3457	3458	3588	3589	3590	3595	3596
U 1390	3599	3600	3601	3602	3603	3617	3618	3623
U 1398	3624	3627	3628	3629	3630	3631	3646	3647
U 13A0	3652	3653	3656	3657	3658	3659	3660	3675
U 13A8	3676	3681	3682	3685	3686	3687	3688	3689
U 13B0	3704	3705	3710	3711	3714	3715	3716	3717
U 13B8	3718	3733	3734	3739	3740	3743	3744	3745
U 13C0	3746	3747	3761	3762	3767	3768	3771	3772
U 13C8	3782	3785	3786	3791	3792	3795	3796	3807
U 13D0	3810	3811	3816	3817	3820	3821	3822	3823
U 13D8	3824	3916	3919	3920	3925	3926	3929	3930
U 13E0	3931	3932	3933	3934	3946	3947	3952	3953
U 13E8	3956	3957	3958	3959	3960	3961	4011	
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F6	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

SEQ 0911
Page 10

Words not in bounds

ESKODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH35	1023

Used	1023
Remaining	

```
Total microwords used in memory U: 1023
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```


ZZ-ESKAH-V132 Line Number Index
ESKAH35.MCR

MICRO2 1M(01)

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B 8

SEQ 0912
Page 10

; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH35.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

00000

000000

0

0000000000

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2392	TEST 127 EXECUTION POINT COUNTER AND FIRST PART DONE
: 2549	TEST 128 COMPATABILITY MODE A FORK DECODE
: 2664	TEST 129 COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE
: 2763	TEST 12A COMPATABILITY MODE B FORK DECODE
: 2882	TEST 12B COMPATABILITY MODE C FORK DECODE
: 2946	TEST 12C COMPATABILITY MODE STALL LOGIC
: 3033	TEST 12D COMPATABILITY MODE D MUX SELECT
: 3270	TEST 12E IBA BIT<1:0> CONTROL
: 3481	TEST 12F M8224 IRD ROM BRANCH TEST
: 3610	TEST 130 M8224 IRD EXECUTION POINT COUNTER TEST

ZZ-ESKAH-V132 Subroutines
ESKAH36.MCR

MICRO2 1M(01) 16-DEC-82 12:16:21

D 8

SEQ 0914
Page

:1
:1804
:1805
.NOLIST
.LIST

ZZ-ESKAH-V132 Subroutines
ESKAH36.MCR
MICRO2 1M(01) 16-DEC-82 12:16:21
D 8
SEQ 0914
Page
:1
:1804
:1805
.NOLIST
.LIST

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:1806
:1807
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```

U 1100, 0000,003C,19C0,0A78,0084,7001

U 1101, 0000,003C,05C0,0A78,0084,7001

U 1102, 0000,003C,09C0,0A78,0084,7001

U 1103, 0000,003C,0DC0,0A78,0084,7001

U 1104, 0000,003C,11C0,0A78,0084,7001

U 1105, 0000,003C,D5C0,0A78,0084,7001

U 1106, 0000,003C,D9C0,0A78,0084,7001

U 1107, 0000,003C,5DC0,0A78,0084,7001

U 1108, 0000,003C,01C0,0A78,0084,7001

U 110C, 0000,003C,85C0,0A78,0084,7001

U 110D, 0000,003C,89C0,0A78,0084,7001

U 110E, 0000,003C,65C0,0A78,0084,7001

U 110F, 0000,003C,61C0,0A78,0084,7109

U 1001, 0001,2024,0180,0800,0010,1006

U 1006, 0000,013C,0180,0800,0000,1002

U 1002, 0001,2036,0180,0AF8,0000,0000

.REGION/1000,13FF

:+
 : FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 : WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 : R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 : THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 : THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

: FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
 : 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 : ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 : R[OF] AND DO A RETURN.

: IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 : READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 : TO THE CONSOLE.

: THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 : ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN IF THE TRAP WAS
 : EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 : RETURN IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 : STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

```

1100: SC_K[ZERO],Q_R[OF],J/TRPH0      : SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0      : DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0      : X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0      : TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0      : TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0      : TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0      : RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0      : TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0      : CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0      : RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0      : TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0     : ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2     : CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC    : WAS TRAP EXPECTED?
      Z?                               : BRANCH IF NO
=0    ALU_Q[AND]MASK,R[OF],ALU.RETURN : CLEAR THE BIT AND RETURN

```

:+
 : THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 : IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 : FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

      DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER

```



```

:1861      :      CACHE PARITY REGISTER
:1862      :      TB ERROR REGISTER 1
:1863      :      TB ERROR REGISTER 0
:1864      :      -
:1865
U 1003, 0018,0038,1D80,09E8,0000,1004 :1866 TRPH1: RC[0D],SC
U 1004, 0000,003D,D980,0800,0084,71BE :1867 =0 SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,100B :1868 Q_ID[TBER0]
U 100B, 0001,203C,4DF0,2DB0,0000,100E :1869 RC[6],Q,Q_ID[TBER1]
U 100E, 0001,203C,65F0,2DB8,0000,1013 :1870 RC[7],Q,Q_ID[SBI.ERR]
U 1013, 0001,203C,6DF0,2DD8,0000,1017 :1871 RC[0B],Q,Q_ID[FAULT]
U 1017, 0001,203C,75F0,2DE0,0000,104F :1872 RC[0C],Q,Q_ID[MAINT]
U 104F, 0001,203C,79F0,2DC8,0000,105B :1873 RC[9],Q,Q_ID[PARITY]
U 105B, 0001,203C,69F0,2DC0,0000,105F :1874 RC[8],Q,Q_ID[TIME.ADDR]
U 105F, 0001,203C,81F0,2DD0,0000,1000 :1875 RC[0A],Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11A3 :1876 1000: RC[0E],Q,ERROR1
:1877
:1878 :+
:1879 : THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
:1880 :-
:1881
U 1109, 0001,2024,0180,0800,0010,1154 :1882 TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS THE TRAP EXPECTED?
U 1154, 0000,013C,0180,0800,0000,100C :1883 Z? ; BRANCH IF NO
U 100C, 0001,2036,0180,0AF8,0000,0001 :1884 =0 ALU Q[AND]MASK,R[0F],ALU,RETURN1 ; RETURN
U 100D, 0000,003C,0180,0800,0000,1003 :1885 J/TRPH1 ; REPORT UNEXPECTED TRAP
:1886
:1887
:1888 :+
:1889 : THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
:1890 : MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
:1891 : NEWTST
:1892 : ERLOOP
:1893 : ERROR1
:1894 : ERROR2
:1895 :
:1896
U 118E, 0000,003C,65F8,0800,0084,718F :1897 SCOPE: SC_K[.10],Q_0 ; SETUP TO WRITE IPL OF 1F
U 118F, 0818,0038,8D80,0800,0000,1190 :1898 D_R[.1F] ; ...
U 1190, 0D00,003C,0180,0800,0000,1191 :1899 D-DAL.SC
U 1191, 0000,003C,3D80,3C00,0000,1192 :1900 ID[PSL],D ; WRITE THE PSL
U 1192, 0818,0038,0580,0800,0000,1193 :1901 D_K[.1] ; SETUP TO CLEAR THE CES REGISTER
U 1193, 0D00,003C,0180,0800,0000,1194 :1902 D-DAL.SC
U 1194, 0F00,003C,3180,3C00,0000,1195 :1903 ID[CES],D,D_0 ; CLEAR THE CES REGISTER
U 1195, 0000,003C,5D80,3C00,0000,1196 :1904 ID[ACC.CS],D ; SHUT OFF THE FLOATING POINT
U 1196, 0000,003C,3980,3C00,0000,1197 :1905 ID[SIR],D ; CLEAR THE SIR REGISTER
U 1197, 0000,003C,2980,3C00,0000,1198 :1906 ID[CLK.CS],D ; STOP INTERVAL TIMER
U 1198, 0000,003C,4980,3C00,0000,1199 :1907 ID[TBER0],D ; SHUT OFF THE TB
U 1199, 0000,003C,7180,3C00,0000,119A :1908 ID[COMP],D ; CLEAR SILO COMPARATOR
U 119A, 0818,0038,C180,0800,0000,119B :1909 D_K[.FFFF]
U 119B, 0000,003C,6580,3C00,0000,119C :1910 ID[SBI.ERR],D
U 119C, 0F00,003C,6D80,3C00,0000,119D :1911 ID[FAULT],D,D_0
U 119D, 0000,003C,6D80,3C00,0000,119E :1912 ID[FAULT],D
U 119E, 0000,003C,6580,3C00,0000,119F :1913 ID[SBI.ERR],D
U 119F, 0003,003C,0180,09F0,0000,11A0 :1914 RC[0E],0
U 11A0, 0003,003C,0180,0AF8,0000,11A1 :1915 RC[0F],0

```

```

U 11A1, 0003,003C,0180,09E8,0000,105E :1916
U 11A2, 0818,0038,0980,0800,0000,105E :1917
U 11A3, 0810,0038,0180,0978,0000,11A4 :1918
U 11A4, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 11A5, 0810,0038,0180,0978,0000,11A6 :1922
U 11A6, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
U 105E, 0000,003C,1D80,3C00,0000,105E :1927
:1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,11A7 :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 11A7, 0018,0038,1980,0800,0000,11B7 :1966
U 11A8, 0018,0038,1980,0800,0000,11B8 :1967
U 11A9, 0018,0038,1980,0800,0000,11B9 :1968
U 11AA, 0018,0038,1980,0800,0000,11BA :1969
U 11AB, 0018,0038,0980,0800,0000,11B7 :1970

```

```

RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE

;+
; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
;-

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

;+
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
; THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
;
;=0 D 0,CALL,J/DC5
; NOP
;=0 CALL,J/DC5
;-

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```

```

U 11AC, 0018,0038,0980,0800,0000,11B8 :1971
U 11AD, 0018,0038,0980,0800,0000,11B9 :1972
U 11AE, 0018,0038,0980,0800,0000,11BA :1973
U 11AF, 0018,0038,0580,0800,0000,11B7 :1974
U 11B0, 0018,0038,0580,0800,0000,11B8 :1975
U 11B1, 0018,0038,0580,0800,0000,11B9 :1976
U 11B2, 0018,0038,0580,0800,0000,11BA :1977
U 11B3, 0018,0038,C180,0800,0000,11B7 :1978
U 11B4, 0018,0038,C180,0800,0000,11B8 :1979
U 11B5, 0018,0038,C180,0800,0000,11B9 :1980
U 11B6, 0018,0038,C180,0800,0000,11BA :1981
:1982
U 11B7, 0118,0038,1B80,0800,0000,11B8 :1983
U 11B8, 0118,0038,0B80,0800,0000,11B8 :1984
U 11B9, 0118,0038,0780,0800,0000,11B8 :1985
U 11BA, 0118,0038,C380,0800,0000,11B8 :1986
:1987
U 11BB, 0100,003E,0380,0800,0000,0001 :1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
U 11BC, 0B10,0038,4D80,0978,0000,11BD :1998
U 11BD, 0D19,4016,4D80,09F8,0000,0001 :1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
U 11BE, 0010,0038,01C0,0978,0000,11BF :2007
U 11BF, 0019,2034,4DC0,0800,0000,11C0 :2008
U 11C0, 0019,2032,1D80,09F8,0000,0001 :2009
:2010

```

```

DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_O(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT

```

```

: +
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
: -

```

```

SUBTST: D_RC[OF],KMX/.FF00
RC[OF]_D+K[.FF00],WORD,RETURN1

```

```

: +
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
: -

```

```

SETRCF: Q_RC[OF]
Q-Q.AND.K[.FF00]
RC[OF]_Q.OR.SC,RETURN1

```

```

:2011
:2012
:2013 :+ THE FOLLOWING LOCATIONS ARE RESERVED FOR PATCHES
:2014 :-
:2015
U 13E0, 0000,003C,0180,0800,0000,13E1 :2016 13E0: NOP
U 13E1, 0000,003C,0180,0800,0000,13E2 :2017 13E1: NOP
U 13E2, 0000,003C,0180,0800,0000,13E3 :2018 13E2: NOP
U 13E3, 0000,003C,0180,0800,0000,13E4 :2019 13E3: NOP
U 13E4, 0000,003C,0180,0800,0000,13E5 :2020 13E4: NOP
U 13E5, 0000,003C,0180,0800,0000,13E6 :2021 13E5: NOP
U 13E6, 0000,003C,0180,0800,0000,13E7 :2022 13E6: NOP
U 13E7, 0000,003C,0180,0800,0000,11C1 :2023 13E7: NOP
:2024
:2025
:2026 :+ THIS SUBROUTINE IS USED TO SET THE FIRST PART DONE BIT IN THE PSL
:2027 :-
:2028
U 11C1, 0818,0038,0180,0800,0000,11C2 :2029 SETFPD: D_K[.8]
U 11C2, 0800,003C,3DF0,2C00,0000,11C3 :2030 D_D.SWAP,Q_ID[PSL] ; READ THE PSL
U 11C3, 081D,0030,0180,0800,0000,11C4 :2031 D_D.OR,Q ; OR IN FPD
U 11C4, 0000,003E,3D80,3C00,0000,0001 :2032 ID[PSL]_D,RETURN1 ; LOAD THE PSL
:2033
:2034 :+ THIS SUBROUTINE IS USED TO CLEAR THE FPD BIT IN THE PSL
:2035 :-
:2036
:2037
U 11C5, 0818,0038,0180,0800,0000,11C6 :2038 CLRFPD: D_K[.8]
U 11C6, 0800,003C,3DF0,2C00,0000,11C7 :2039 D_D.SWAP,Q_ID[PSL] ; READ THE PSL
U 11C7, 081D,2024,0180,0800,0000,11C8 :2040 D_Q.ANDNOT,D ; CLEAR THE FPD BIT
U 11C8, 0000,003E,3D80,3C00,0000,0001 :2041 ID[PSL]_D,RETURN1 ; LOAD THE PSL
:2042
:2043 :+ THE FOLLOWING SUB ROUTINE IS USED TO CHECK IF THE "TWINKLE" ECO
:2044 : IS INSTALLED ON THIS MACHINE. THIS IS DONE BY CHECKING THE ECO
:2045 : LEVEL OF THE MACHINE AS RECORDED IN THE SYSTEM ID REGISTER. "TWINKLED"
:2046 : MACHINES WILL HAVE AN ECO LEVEL OF '70' OR GREATER.
:2047
:2048 : THIS ROUTINE MUST BE CALLED WITH A CONSTRAINT OF '=00'.
:2049
:2050 : THE ROUTINE EXITS WITH THE CONTENTS OF RC[OC] IN THE D REGISTER.
:2051 : A "RETURN1" IS MADE IF THE ECO IS PRESENT OTHERWISE, A RETURN2
:2052 : IS MADE.
:2053 :-
:2054
:2055 CHECK_TWINKLE:
U 11C9, 0000,003C,0DF0,2C00,0000,11CA :2056 Q_ID[SYS.ID] ; GET SYSTEM ECO LEVEL
U 11CA, 0C00,003C,6180,0800,0000,11CB :2057 D_Q,K[.F]
U 11CB, 001B,0000,6180,0800,0082,11CC :2058 SC Q-K[.F] ; SETUP TO SHIFT RIGHT
U 11CC, 0D00,003C,0180,0800,0000,1020 :2059 D_DAL.SC ; PUT IN BITS<8:0>
U 1020, 0818,0039,8DE0,0800,0000,11B6 :2060 =0 Q_D,D_K[.1F],CALL[DCF] ; GENERATE FIELD MASK (= 1FF(X))
U 1021, 081D,0034,0180,0800,0000,11CD :2061 D_D.AND,Q ; MASK
U 11CD, 0018,0038,F9C0,0800,0000,11CE :2062 Q_K[.7E] ; GENERATE ECO LEVEL OF A "TWINKLED"
U 11CE, 0019,2034,CDC0,0800,0000,11CF :2063 Q_Q.AND,K[.F0] ; MACHINE (= 70(X))
U 11CF, 001D,0000,0180,0800,0010,11D0 :2064 ACU_D-Q,CLK_UBCC ; IS THIS MACHINE TWINKLED?
U 11D0, 0810,1B38,0180,0960,0000,1007 :2065 ALU.N?,D_RC[OC]

```


U 1007, 0000,003E,0180,0800,0000,0001 :2066
U 100F, 0000,003E,0180,0800,0000,0002 :2067

=0111 RETURN1
RETURN2

; BRANCH IF YES
; NO

++ THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.

U 11D1, 0038,003B,41C0,0800,0000,1200 :2078

SYNCOO:

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL

U 1200, 0019,2000,05C0,0800,0000,1201 :2079
U 1201, 0019,2000,05C0,0800,0000,1202 :2080
U 1202, 0019,2000,05C0,0800,0000,1203 :2081
U 1203, 0019,2000,05C0,0800,0000,1204 :2082
U 1204, 0019,2000,05C0,0800,0000,1205 :2083
U 1205, 0019,2000,05C0,0800,0000,1206 :2084
U 1206, 0019,2000,05C0,0800,0000,1207 :2085
U 1207, 0019,2000,05C0,0800,0000,1208 :2086
U 1208, 0019,2000,05C0,0800,0000,1209 :2087
U 1209, 0019,2000,05C0,0800,0000,120A :2088
U 120A, 0019,2000,05C0,0800,0000,120B :2089
U 120B, 0019,2000,05C0,0800,0000,120C :2090
U 120C, 0019,2000,05C0,0800,0000,120D :2091
U 120D, 0019,2000,05C0,0800,0000,120E :2092
U 120E, 0019,2000,05C0,0800,0000,120F :2093
U 120F, 0019,2000,05C0,0800,0000,1210 :2094
U 1210, 0019,2000,05C0,0800,0000,1211 :2095
U 1211, 0019,2000,05C0,0800,0000,1212 :2096
U 1212, 0019,2000,05C0,0800,0000,1213 :2097
U 1213, 0019,2000,05C0,0800,0000,1214 :2098
U 1214, 0019,2000,05C0,0800,0000,1215 :2099
U 1215, 0019,2000,05C0,0800,0000,1216 :2100
U 1216, 0019,2000,05C0,0800,0000,1217 :2101
U 1217, 0019,2000,05C0,0800,0000,1218 :2102
U 1218, 0019,2000,05C0,0800,0000,1219 :2103
U 1219, 0019,2000,05C0,0800,0000,121A :2104
U 121A, 0019,2000,05C0,0800,0000,121B :2105
U 121B, 0019,2000,05C0,0800,0000,121C :2106
U 121C, 0019,2000,05C0,0800,0000,121D :2107
U 121D, 0019,2000,05C0,0800,0000,121E :2108
U 121E, 0019,2000,05C0,0800,0000,121F :2109
U 121F, 0019,2000,05C0,0800,0000,1220 :2110
U 1220, 0019,2000,05C0,0800,0000,1221 :2111
U 1221, 0019,2000,05C0,0800,0000,1222 :2112
U 1222, 0019,2000,05C0,0800,0000,1223 :2113
U 1223, 0019,2000,05C0,0800,0000,1224 :2114
U 1224, 0019,2000,05C0,0800,0000,1225 :2115

1200:

DISPATTBL:

1200: Q-Q-K[.1]
1201: Q-Q-K[.1]
1202: Q-Q-K[.1]
1203: Q-Q-K[.1]
1204: Q-Q-K[.1]
1205: Q-Q-K[.1]
1206: Q-Q-K[.1]
1207: Q-Q-K[.1]
1208: Q-Q-K[.1]
1209: Q-Q-K[.1]
120A: Q-Q-K[.1]
120B: Q-Q-K[.1]
120C: Q-Q-K[.1]
120D: Q-Q-K[.1]
120E: Q-Q-K[.1]
120F: Q-Q-K[.1]
1210: Q-Q-K[.1]
1211: Q-Q-K[.1]
1212: Q-Q-K[.1]
1213: Q-Q-K[.1]
1214: Q-Q-K[.1]
1215: Q-Q-K[.1]
1216: Q-Q-K[.1]
1217: Q-Q-K[.1]
1218: Q-Q-K[.1]
1219: Q-Q-K[.1]
121A: Q-Q-K[.1]
121B: Q-Q-K[.1]
121C: Q-Q-K[.1]
121D: Q-Q-K[.1]
121E: Q-Q-K[.1]
121F: Q-Q-K[.1]
1220: Q-Q-K[.1]
1221: Q-Q-K[.1]
1222: Q-Q-K[.1]
1223: Q-Q-K[.1]
1224: Q-Q-K[.1]

U	1225.	0019.	2000.	05C0.	0800.	0000.	1226	:	2121	1225:	Q-Q-K[.1]
U	1226.	0019.	2000.	05C0.	0800.	0000.	1227	:	2122	1226:	Q-Q-K[.1]
U	1227.	0019.	2000.	05C0.	0800.	0000.	1228	:	2123	1227:	Q-Q-K[.1]
U	1228.	0019.	2000.	05C0.	0800.	0000.	1229	:	2124	1228:	Q-Q-K[.1]
U	1229.	0019.	2000.	05C0.	0800.	0000.	122A	:	2125	1229:	Q-Q-K[.1]
U	122A.	0019.	2000.	05C0.	0800.	0000.	122B	:	2126	122A:	Q-Q-K[.1]
U	122B.	0019.	2000.	05C0.	0800.	0000.	122C	:	2127	122B:	Q-Q-K[.1]
U	122C.	0019.	2000.	05C0.	0800.	0000.	122D	:	2128	122C:	Q-Q-K[.1]
U	122D.	0019.	2000.	05C0.	0800.	0000.	122E	:	2129	122D:	Q-Q-K[.1]
U	122E.	0019.	2000.	05C0.	0800.	0000.	122F	:	2130	122E:	Q-Q-K[.1]
U	122F.	0019.	2000.	05C0.	0800.	0000.	1230	:	2131	122F:	Q-Q-K[.1]
U	1230.	0019.	2000.	05C0.	0800.	0000.	1231	:	2132	1230:	Q-Q-K[.1]
U	1231.	0019.	2000.	05C0.	0800.	0000.	1232	:	2133	1231:	Q-Q-K[.1]
U	1232.	0019.	2000.	05C0.	0800.	0000.	1233	:	2134	1232:	Q-Q-K[.1]
U	1233.	0019.	2000.	05C0.	0800.	0000.	1234	:	2135	1233:	Q-Q-K[.1]
U	1234.	0019.	2000.	05C0.	0800.	0000.	1235	:	2136	1234:	Q-Q-K[.1]
U	1235.	0019.	2000.	05C0.	0800.	0000.	1236	:	2137	1235:	Q-Q-K[.1]
U	1236.	0019.	2000.	05C0.	0800.	0000.	1237	:	2138	1236:	Q-Q-K[.1]
U	1237.	0019.	2000.	05C0.	0800.	0000.	1238	:	2139	1237:	Q-Q-K[.1]
U	1238.	0019.	2000.	05C0.	0800.	0000.	1239	:	2140	1238:	Q-Q-K[.1]
U	1239.	0019.	2000.	05C0.	0800.	0000.	123A	:	2141	1239:	Q-Q-K[.1]
U	123A.	0019.	2000.	05C0.	0800.	0000.	123B	:	2142	123A:	Q-Q-K[.1]
U	123B.	0019.	2000.	05C0.	0800.	0000.	123C	:	2143	123B:	Q-Q-K[.1]
U	123C.	0019.	2000.	05C0.	0800.	0000.	123D	:	2144	123C:	Q-Q-K[.1]
U	123D.	0019.	2000.	05C0.	0800.	0000.	123E	:	2145	123D:	Q-Q-K[.1]
U	123E.	0019.	2000.	05C0.	0800.	0000.	123F	:	2146	123E:	Q-Q-K[.1]
U	123F.	0019.	2000.	05C0.	0800.	0000.	1240	:	2147	123F:	Q-Q-K[.1]
U	1240.	0019.	2000.	05C0.	0800.	0000.	1241	:	2148	1240:	Q-Q-K[.1]
U	1241.	0019.	2000.	05C0.	0800.	0000.	1242	:	2149	1241:	Q-Q-K[.1]
U	1242.	0019.	2000.	05C0.	0800.	0000.	1243	:	2150	1242:	Q-Q-K[.1]
U	1243.	0019.	2000.	05C0.	0800.	0000.	1244	:	2151	1243:	Q-Q-K[.1]
U	1244.	0019.	2000.	05C0.	0800.	0000.	1245	:	2152	1244:	Q-Q-K[.1]
U	1245.	0019.	2000.	05C0.	0800.	0000.	1246	:	2153	1245:	Q-Q-K[.1]
U	1246.	0019.	2000.	05C0.	0800.	0000.	1247	:	2154	1246:	Q-Q-K[.1]
U	1247.	0019.	2000.	05C0.	0800.	0000.	1248	:	2155	1247:	Q-Q-K[.1]
U	1248.	0019.	2000.	05C0.	0800.	0000.	1249	:	2156	1248:	Q-Q-K[.1]
U	1249.	0019.	2000.	05C0.	0800.	0000.	124A	:	2157	1249:	Q-Q-K[.1]
U	124A.	0019.	2000.	05C0.	0800.	0000.	124B	:	2158	124A:	Q-Q-K[.1]
U	124B.	00									

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U 125C.	0019.2000.05C0.0800.0000.125D	:2176	125C:	Q-Q-K[.1]
U 125D.	0019.2000.05C0.0800.0000.125E	:2177	125D:	Q-Q-K[.1]
U 125E.	0019.2000.05C0.0800.0000.125F	:2178	125E:	Q-Q-K[.1]
U 125F.	0019.2000.05C0.0800.0000.1260	:2179	125F:	Q-Q-K[.1]
U 1260.	0019.2000.05C0.0800.0000.1261	:2180	1260:	Q-Q-K[.1]
U 1261.	0019.2000.05C0.0800.0000.1262	:2181	1261:	Q-Q-K[.1]
U 1262.	0019.2000.05C0.0800.0000.1263	:2182	1262:	Q-Q-K[.1]
U 1263.	0019.2000.05C0.0800.0000.1264	:2183	1263:	Q-Q-K[.1]
U 1264.	0019.2000.05C0.0800.0000.1265	:2184	1264:	Q-Q-K[.1]
U 1265.	0019.2000.05C0.0800.0000.1266	:2185	1265:	Q-Q-K[.1]
U 1266.	0019.2000.05C0.0800.0000.1267	:2186	1266:	Q-Q-K[.1]
U 1267.	0019.2000.05C0.0800.0000.1268	:2187	1267:	Q-Q-K[.1]
U 1268.	0019.2000.05C0.0800.0000.1269	:2188	1268:	Q-Q-K[.1]
U 1269.	0019.2000.05C0.0800.0000.126A	:2189	1269:	Q-Q-K[.1]
U 126A.	0019.2000.05C0.0800.0000.126B	:2190	126A:	Q-Q-K[.1]
U 126B.	0019.2000.05C0.0800.0000.126C	:2191	126B:	Q-Q-K[.1]
U 126C.	0019.2000.05C0.0800.0000.126D	:2192	126C:	Q-Q-K[.1]
U 126D.	0019.2000.05C0.0800.0000.126E	:2193	126D:	Q-Q-K[.1]
U 126E.	0019.2000.05C0.0800.0000.126F	:2194	126E:	Q-Q-K[.1]
U 126F.	0019.2000.05C0.0800.0000.1270	:2195	126F:	Q-Q-K[.1]
U 1270.	0019.2000.05C0.0800.0000.1271	:2196	1270:	Q-Q-K[.1]
U 1271.	0019.2000.05C0.0800.0000.1272	:2197	1271:	Q-Q-K[.1]
U 1272.	0019.2000.05C0.0800.0000.1273	:2198	1272:	Q-Q-K[.1]
U 1273.	0019.2000.05C0.0800.0000.1274	:2199	1273:	Q-Q-K[.1]
U 1274.	0019.2000.05C0.0800.0000.1275	:2200	1274:	Q-Q-K[.1]
U 1275.	0019.2000.05C0.0800.0000.1276	:2201	1275:	Q-Q-K[.1]
U 1276.	0019.2000.05C0.0800.0000.1277	:2202	1276:	Q-Q-K[.1]
U 1277.	0019.2000.05C0.0800.0000.1278	:2203	1277:	Q-Q-K[.1]
U 1278.	0019.2000.05C0.0800.0000.1279	:2204	1278:	Q-Q-K[.1]
U 1279.	0019.2000.05C0.0800.0000.127A	:2205	1279:	Q-Q-K[.1]
U 127A.	0019.2000.05C0.0800.0000.127B	:2206	127A:	Q-Q-K[.1]
U 127B.	0019.2000.05C0.0800.0000.127C	:2207	127B:	Q-Q-K[.1]
U 127C.	0019.2000.05C0.0800.0000.127D	:2208	127C:	Q-Q-K[.1]
U 127D.	0019.2000.05C0.0800.0000.127E	:2209	127D:	Q-Q-K[.1]
U 127E.	0019.2000.05C0.0800.0000.127F	:2210	127E:	Q-Q-K[.1]
U 127F.	0019.2000.05C0.0800.0000.1280	:2211	127F:	Q-Q-K[.1]
U 1280.	0019.2000.05C0.0800.0000.1281	:2212	1280:	Q-Q-K[.1]
U 1281.	0019.2000.05C0.0800.0000.1282	:2213	1281:	Q-Q-K[.1]
U 1282.	0019.2000.05C0.0800.0000.1283	:2214	1282:	Q-Q-K[.1]
U 1283.	0019.2000.05C0.0800.0000.1284	:2215	1283:	Q-Q-K[.1]
U 1284.	0019.2000.05C0.0800.0000.1285	:2216	1284:	Q-Q-K[.1]
U 1285.	0019.2000.05C0.0800.0000.1286	:2217	1285:	Q-Q-K[.1]
U 1286.	0019.2000.05C0.0800.0000.1287	:2218	1286:	Q-Q-K[.1]
U 1287.	0019.2000.05C0.0800.0000.1288	:2219	1287:	Q-Q-K[.1]
U 1288.	0019.2000.05C0.0800.0000.1289	:2220	1288:	Q-Q-K[.1]
U 1289.	0019.2000.05C0.0800.0000.128A	:2221	1289:	Q-Q-K[.1]
U 128A.	0019.2000.05C0.0800.0000.128B	:2222	128A:	Q-Q-K[.1]
U 128B.	0019.2000.05C0.0800.0000.128C	:2223	128B:	Q-Q-K[.1]
U 128C.	0019.2000.05C0.0800.0000.128D	:2224	128C:	Q-Q-K[.1]
U 128D.	0019.2000.05C0.0800.0000.128E	:2225	128D:	Q-Q-K[.1]
U 128E.	0019.2000.05C0.0800.0000.128F	:2226	128E:	Q-Q-K[.1]
U 128F.	0019.2000.05C0.0800.0000.1290	:2227	128F:	Q-Q-K[.1]
U 1290.	0019.2000.05C0.0800.0000.1291	:2228	1290:	Q-Q-K[.1]
U 1291.	0019.2000.05C0.0800.0000.1292	:2229	1291:	Q-Q-K[.1]
U 1292.	0019.2000.05C0.0800.0000.1293	:2230	1292:	Q-Q-K[.1]

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U 1293.	0019.2000.05C0.0800.0000.1294	:2231	1293:	Q-Q-K[.1]
U 1294.	0019.2000.05C0.0800.0000.1295	:2232	1294:	Q-Q-K[.1]
U 1295.	0019.2000.05C0.0800.0000.1296	:2233	1295:	Q-Q-K[.1]
U 1296.	0019.2000.05C0.0800.0000.1297	:2234	1296:	Q-Q-K[.1]
U 1297.	0019.2000.05C0.0800.0000.1298	:2235	1297:	Q-Q-K[.1]
U 1298.	0019.2000.05C0.0800.0000.1299	:2236	1298:	Q-Q-K[.1]
U 1299.	0019.2000.05C0.0800.0000.129A	:2237	1299:	Q-Q-K[.1]
U 129A.	0019.2000.05C0.0800.0000.129B	:2238	129A:	Q-Q-K[.1]
U 129B.	0019.2000.05C0.0800.0000.129C	:2239	129B:	Q-Q-K[.1]
U 129C.	0019.2000.05C0.0800.0000.129D	:2240	129C:	Q-Q-K[.1]
U 129D.	0019.2000.05C0.0800.0000.129E	:2241	129D:	Q-Q-K[.1]
U 129E.	0019.2000.05C0.0800.0000.129F	:2242	129E:	Q-Q-K[.1]
U 129F.	0019.2000.05C0.0800.0000.12A0	:2243	129F:	Q-Q-K[.1]
U 12A0.	0019.2000.05C0.0800.0000.12A1	:2244	12A0:	Q-Q-K[.1]
U 12A1.	0019.2000.05C0.0800.0000.12A2	:2245	12A1:	Q-Q-K[.1]
U 12A2.	0019.2000.05C0.0800.0000.12A3	:2246	12A2:	Q-Q-K[.1]
U 12A3.	0019.2000.05C0.0800.0000.12A4	:2247	12A3:	Q-Q-K[.1]
U 12A4.	0019.2000.05C0.0800.0000.12A5	:2248	12A4:	Q-Q-K[.1]
U 12A5.	0019.2000.05C0.0800.0000.12A6	:2249	12A5:	Q-Q-K[.1]
U 12A6.	0019.2000.05C0.0800.0000.12A7	:2250	12A6:	Q-Q-K[.1]
U 12A7.	0019.2000.05C0.0800.0000.12A8	:2251	12A7:	Q-Q-K[.1]
U 12A8.	0019.2000.05C0.0800.0000.12A9	:2252	12A8:	Q-Q-K[.1]
U 12A9.	0019.2000.05C0.0800.0000.12AA	:2253	12A9:	Q-Q-K[.1]
U 12AA.	0019.2000.05C0.0800.0000.1155	:2254	12AA:	Q-Q-K[.1]
U 1155.	0019.2000.05C0.0800.0000.12AB	:2255	1155:	Q-Q-K[.1]
U 12AB.	0019.2000.05C0.0800.0000.12AC	:2256	12AB:	Q-Q-K[.1]
U 12AC.	0019.2000.05C0.0800.0000.12AD	:2257	12AC:	Q-Q-K[.1]
U 12AD.	0019.2000.05C0.0800.0000.12AE	:2258	12AD:	Q-Q-K[.1]
U 12AE.	0019.2000.05C0.0800.0000.12AF	:2259	12AE:	Q-Q-K[.1]
U 12AF.	0019.2000.05C0.0800.0000.12B0	:2260	12AF:	Q-Q-K[.1]
U 12B0.	0019.2000.05C0.0800.0000.12B1	:2261	12B0:	Q-Q-K[.1]
U 12B1.	0019.2000.05C0.0800.0000.12B2	:2262	12B1:	Q-Q-K[.1]
U 12B2.	0019.2000.05C0.0800.0000.12B3	:2263	12B2:	Q-Q-K[.1]
U 12B3.	0019.2000.05C0.0800.0000.12B4	:2264	12B3:	Q-Q-K[.1]
U 12B4.	0019.2000.05C0.0800.0000.12B5	:2265	12B4:	Q-Q-K[.1]
U 12B5.	0019.2000.05C0.0800.0000.12B6	:2266	12B5:	Q-Q-K[.1]
U 12B6.	0019.2000.05C0.0800.0000.12B7	:2267	12B6:	Q-Q-K[.1]
U 12B7.	0019.2000.05C0.0800.0000.12B8	:2268	12B7:	Q-Q-K[.1]
U 12B8.	0019.2000.05C0.0800.0000.12B9	:2269	12B8:	Q-Q-K[.1]
U 12B9.	0019.2000.05C0.0800.0000.12BA	:2270	12B9:	Q-Q-K[.1]
U 12BA.	0019.2000.05C0.0800.0000.12BB	:2271	12BA:	Q-Q-K[.1]
U 12BB.	0019.2000.05C0.0800.0000.12BC	:2272	12BB:	Q-Q-K[.1]
U 12BC.	0019.2000.05C0.0800.0000.12BD	:2273	12BC:	Q-Q-K[.1]
U 12BD.	0019.2000.05C0.0800.0000.12BE	:2274	12BD:	Q-Q-K[.1]
U 12BE.	0019.2000.05C0.0800.0000.12BF	:2275	12BE:	Q-Q-K[.1]
U 12BF.	0019.2000.05C0.0800.0000.12C0	:2276	12BF:	Q-Q-K[.1]
U 12C0.	0019.2000.05C0.0800.0000.12C1	:2277	12C0:	Q-Q-K[.1]
U 12C1.	0019.2000.05C0.0800.0000.12C2	:2278	12C1:	Q-Q-K[.1]
U 12C2.	0019.2000.05C0.0800.0000.12C3	:2279	12C2:	Q-Q-K[.1]
U 12C3.	0019.2000.05C0.0800.0000.12C4	:2280	12C3:	Q-Q-K[.1]
U 12C4.	0019.2000.05C0.0800.0000.12C5	:2281	12C4:	Q-Q-K[.1]
U 12C5.	0019.2000.05C0.0800.0000.12C6	:2282	12C5:	Q-Q-K[.1]
U 12C6.	0019.2000.05C0.0800.0000.12C7	:2283	12C6:	Q-Q-K[.1]
U 12C7.	0019.2000.05C0.0800.0000.12C8	:2284	12C7:	Q-Q-K[.1]
U 12C8.	0019.2000.05C0.0800.0000.12C9	:2285	12C8:	Q-Q-K[.1]

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; THIS WORD IS ECO'D TO 1155

U 12C9,	0019,2000,05C0,0800,0000,12CA	:2286	12C9:	Q-Q-K[.1]
U 12CA,	0019,2000,05C0,0800,0000,12CB	:2287	12CA:	Q-Q-K[.1]
U 12CB,	0019,2000,05C0,0800,0000,12CC	:2288	12CB:	Q-Q-K[.1]
U 12CC,	0019,2000,05C0,0800,0000,12CD	:2289	12CC:	Q-Q-K[.1]
U 12CD,	0019,2000,05C0,0800,0000,12CE	:2290	12CD:	Q-Q-K[.1]
U 12CE,	0019,2000,05C0,0800,0000,12CF	:2291	12CE:	Q-Q-K[.1]
U 12CF,	0019,2000,05C0,0800,0000,12D0	:2292	12CF:	Q-Q-K[.1]
U 12D0,	0019,2000,05C0,0800,0000,12D1	:2293	12D0:	Q-Q-K[.1]
U 12D1,	0019,2000,05C0,0800,0000,12D2	:2294	12D1:	Q-Q-K[.1]
U 12D2,	0019,2000,05C0,0800,0000,12D3	:2295	12D2:	Q-Q-K[.1]
U 12D3,	0019,2000,05C0,0800,0000,12D4	:2296	12D3:	Q-Q-K[.1]
U 12D4,	0019,2000,05C0,0800,0000,12D5	:2297	12D4:	Q-Q-K[.1]
U 12D5,	0019,2000,05C0,0800,0000,12D6	:2298	12D5:	Q-Q-K[.1]
U 12D6,	0019,2000,05C0,0800,0000,12D7	:2299	12D6:	Q-Q-K[.1]
U 12D7,	0019,2000,05C0,0800,0000,12D8	:2300	12D7:	Q-Q-K[.1]
U 12D8,	0019,2000,05C0,0800,0000,12D9	:2301	12D8:	Q-Q-K[.1]
U 12D9,	0019,2000,05C0,0800,0000,12DA	:2302	12D9:	Q-Q-K[.1]
U 12DA,	0019,2000,05C0,0800,0000,12DB	:2303	12DA:	Q-Q-K[.1]
U 12DB,	0019,2000,05C0,0800,0000,12DC	:2304	12DB:	Q-Q-K[.1]
U 12DC,	0019,2000,05C0,0800,0000,12DD	:2305	12DC:	Q-Q-K[.1]
U 12DD,	0019,2000,05C0,0800,0000,12DE	:2306	12DD:	Q-Q-K[.1]
U 12DE,	0019,2000,05C0,0800,0000,12DF	:2307	12DE:	Q-Q-K[.1]
U 12DF,	0019,2000,05C0,0800,0000,12E0	:2308	12DF:	Q-Q-K[.1]
U 12E0,	0019,2000,05C0,0800,0000,12E1	:2309	12E0:	Q-Q-K[.1]
U 12E1,	0019,2000,05C0,0800,0000,12E2	:2310	12E1:	Q-Q-K[.1]
U 12E2,	0019,2000,05C0,0800,0000,12E3	:2311	12E2:	Q-Q-K[.1]
U 12E3,	0019,2000,05C0,0800,0000,12E4	:2312	12E3:	Q-Q-K[.1]
U 12E4,	0019,2000,05C0,0800,0000,12E5	:2313	12E4:	Q-Q-K[.1]
U 12E5,	0019,2000,05C0,0800,0000,12E6	:2314	12E5:	Q-Q-K[.1]
U 12E6,	0019,2000,05C0,0800,0000,12E7	:2315	12E6:	Q-Q-K[.1]
U 12E7,	0019,2000,05C0,0800,0000,12E8	:2316	12E7:	Q-Q-K[.1]
U 12E8,	0019,2000,05C0,0800,0000,12E9	:2317	12E8:	Q-Q-K[.1]
U 12E9,	0019,2000,05C0,0800,0000,12EA	:2318	12E9:	Q-Q-K[.1]
U 12EA,	0019,2000,05C0,0800,0000,12EB	:2319	12EA:	Q-Q-K[.1]
U 12EB,	0019,2000,05C0,0800,0000,12EC	:2320	12EB:	Q-Q-K[.1]
U 12EC,	0019,2000,05C0,0800,0000,12ED	:2321	12EC:	Q-Q-K[.1]
U 12ED,	0019,2000,05C0,0800,0000,12EE	:2322	12ED:	Q-Q-K[.1]
U 12EE,	0019,2000,05C0,0800,0000,12EF	:2323	12EE:	Q-Q-K[.1]
U 12EF,	0019,2000,05C0,0800,0000,12F0	:2324	12EF:	Q-Q-K[.1]
U 12F0,	0019,2000,05C0,0800,0000,12F1	:2325	12F0:	Q-Q-K[.1]
U 12F1,	0019,2000,05C0,0800,0000,12F2	:2326	12F1:	Q-Q-K[.1]
U 12F2,	0019,2000,05C0,0800,0000,12F3	:2327	12F2:	Q-Q-K[.1]
U 12F3,	0019,2000,05C0,0800,0000,12F4	:2328	12F3:	Q-Q-K[.1]
U 12F4,	0019,2000,05C0,0800,0000,12F5	:2329	12F4:	Q-Q-K[.1]
U 12F5,	0019,2000,05C0,0800,0000,12F6	:2330	12F5:	Q-Q-K[.1]
U 12F6,	0019,2000,05C0,0800,0000,12F7	:2331	12F6:	Q-Q-K[.1]
U 12F7,	0019,2000,05C0,0800,0000,12F8	:2332	12F7:	Q-Q-K[.1]
U 12F8,	0019,2000,05C0,0800,0000,12F9	:2333	12F8:	Q-Q-K[.1]
U 12F9,	0019,2000,05C0,0800,0000,12FA	:2334	12F9:	Q-Q-K[.1]
U 12FA,	0019,2000,05C0,0800,0000,12FB	:2335	12FA:	Q-Q-K[.1]
U 12FB,	0019,2000,05C0,0800,0000,12FC	:2336	12FB:	Q-Q-K[.1]
U 12FC,	0019,2000,05C0,0800,0000,12FD	:2337	12FC:	Q-Q-K[.1]
U 12FD,	0019,2000,05C0,0800,0000,12FE	:2338	12FD:	Q-Q-K[.1]
U 12FE,	0019,2000,05C0,0800,0000,12FF	:2339	12FE:	Q-Q-K[.1]
U 12FF,	0019,2002,05C0,0800,0000,0001	:2340	12FF:	Q-Q-K[.1],RETURN1

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:2341
:2342
:2343
:2344 :+ THIS SUBROUTINE IS USED TO SET THE COMPATABILITY MODE BIT IN THE
:2345 : PSL. THE OTHER BITS IN THE PSL ARE UNCHANGED.
:2346 :-
:2347
U 11D2, 0000,003C,3DF0,2C00,0000,11D3 :2348 SETCM: Q_ID[PSL]
U 11D3, 0000,003C,8D80,0800,0084,71D4 :2349 SC_K[.1F]
U 11D4, 0803,001C,0180,0800,0000,11D5 :2350 D_NOT.MASK
U 11D5, 081D,0030,0180,0800,0000,11D6 :2351 D-D.OR.Q
U 11D6, 0000,003E,3D80,3C00,0000,0001 :2352 ID[PSL],D,RETURN1
:2353
:2354
:2355
:2356 :+ THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
:2357 : CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
:2358 : IS COMPLETELY FULL OF DATA.
:2359
:2360 : BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
:2361 :-
:2362
U 11D7, 3000,003C,0180,6000,0000,11D8 :2363 IBWAIT: LOAD.IB,IBC/START
U 11D8, 0000,003C,0180,F800,0000,11D9 :2364 MCT/ALLOW.IB.READ
U 11D9, 0000,003C,0180,F800,0000,11DA :2365 MCT/ALLOW.IB.READ
U 11DA, 0000,003C,0180,F800,0000,11DB :2366 MCT/ALLOW.IB.READ
U 11DB, 0000,003C,0180,F800,0000,11DC :2367 MCT/ALLOW.IB.READ
U 11DC, 0000,003C,0180,F800,0000,11DD :2368 WAIT1: MCT/ALLOW.IB.READ
U 11DD, 1000,003E,0180,F800,0000,0001 :2369 MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
:2370
:2371
:2372 IBWAITONCE:
:2373 LOAD.IB,IBC/START,J/WAIT1
:2374
:2375
:2376
:2377 :+ THE FOLLOWING SUBROUTINE IS USED BY THE IBA BITS <1:0> TEST. IT ALLOWS
:2378 : THE IB TO READ ONE WORD FROM THE CACHE, AND THEN PUTS BYTE 7 IN BYTE 0.
:2379 :-
:2380
:2381 GETBYTE7:
:2382 IBC/START ; START THE IB
:2383 MCT/ALLOW.IB.READ
:2384 MCT/ALLOW.IB.READ
:2385 MCT/ALLOW.IB.READ
:2386 MCT/ALLOW.IB.READ
:2387 IBC/STOP ; STOP THE IB
:2388 IBC/CLR.0-3 ; SHIFT OUT 4 BYTES
:2389 IBC/CLR.0.1 ; AND TWO MORE
:2390 IBC/CLR.0,RETURN1 ; AND ONE MORE
:2391

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:2392 PAGE "TEST 127 EXECUTION POINT COUNTER AND FIRST PART DONE"
:2393 *****
:2394 ++
:2395
:2396 TEST 127 EXECUTION POINT COUNTER AND FIRST PART DONE
:2397
:2398 TEST DESCRIPTION
:2399 THIS TEST CHECKS THAT THE FIRST PART DONE (FPD) BIT IN THE PSL FORCES
:2400 THE EXECUTION POINT COUNTER TO ALL ONE'S. THIS IS DONE BY LOADING
:2401 THE IB WITH AN "ADDP4" OPCODE, SETTING FPD, EXECUTING THE SUB/SPEC
:2402 FUNCTION AND CHECKING THAT THE CORRECT ADDRESS WAS ASSERTED.
:2403
:2404 THIS TEST ALSO CHECKS THAT THE EXECUTION POINT COUNTER COUNTS WHEN
:2405 THE SUB/SPEC FUNCTION IS EXECUTED AND THE OPCODE DECODE CAUSES
:2406 A "SELECT EXECUTE".
:2407
:2408 SUBTST 1 - CHECK THAT FPD CAUSES THE EXEC POINT COUNTER TO ALL ONE'S.
:2409 SUBTST 2 - CHECK THAT THE EXECUTION POINT COUNTER COUNTS WHEN "SEL
:2410 EXEC" IS TRUE.
:2411 SUBTST 3 - CHECK THAT THE EXEC POINT COUNTER DOES NOT COUNT WHEN
:2412 "SRV+INV" IS TRUE. THIS IS DONE BY EXECUTING A SUB/SPEC
:2413 FUNCTION IN COMPATABILITY MODE WITH B1 INVALID, THEN
:2414 GOING BACK TO VAX MODE AND EXECUTING A SUB/SPEC FUNCTION
:2415 AND CHECKING THAT THE OPCODE WAS DECODED CORRECTLY.
:2416 SUBTST 4 - CHECK THAT THE EXC PNT CTR COUNTS IN COMPATABILITY MODE
:2417 BY EXECUTING A SUB/SPEC FUNCTION IN COMPATABILITY MODE,
:2418 THEN SWITCHING BACK TO VAX MODE AND EXECUTING A SUB/SPEC
:2419 FUNCTION AND CHECKING THAT THE DECODE FOR THE CTR BEING
:2420 AT POINT 1 OCCURRED CORRECTLY.
:2421
:2422 NOTE: THE DATA FOR THIS TEST IS AFTER TEST 12E.
:2423
:2424 LOGIC DESCRIPTION
:2425 THIS TEST CHECKS THE LOGIC THAT CONTROLS THE EXECUTION POINT COUNTER
:2426 ON THE IRC MODULE.
:2427
:2428 ERROR DESCRIPTION
:2429 DATA: EXPECTED MICRO PC BITS <7:0>
:2430 RECEIVED MICRO PC BITS <7:0>
:2431
:2432 SYNC POINT DESCRIPTION
:2433 SUBTST 1 - SYNC06--EXEC POINT COUNTER IS LOADED WITH ALL ONE'S.
:2434 SUBTST 2 - SYNC00--EXECUTION POINT COUNTER SHOULD INCREMENT AT
:2435 THE END OF THIS INSTRUCTION.
:2436 SUBTST 3 - SYNC00--EXECUTION POINT COUNTER SHOULD NOT INCREMENT
:2437 DURING THIS INSTRUCTION.
:2438 SUBTST 4 - SYNC00--EXECUTION POINT COUNTER SHOULD INCREMENT AT
:2439 THE END OF THIS INSTRUCTION.
:2440
:2441 *****
:2442 =0
:2443 T127: NEWTST
:2444 RC[0F] K[.2]
:2445 D_K[.30]
:2446 =0 D_D+K[.C],CALL,J/DCO ; GENERATE ADR OF IB DATA

```

U 1022, 0000,003D,0180,0800,0000,118E
U 1023, 0018,0038,0980,09F8,0000,11E8
U 11E8, 0818,0038,7980,0800,0000,1024
U 1024, 0819,0015,8580,0800,0000,11A7


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U 1025, 0001,003C,0180,0A88,0000,1026 :2447
U 1026, 0818,0039,1180,0800,0000,11AA :2448
U 1027, 0001,003C,0180,09F0,0000,1028 :2449
                                           :2450
                                           :2451
                                           :2452
                                           :2453
                                           :2454
                                           :2455
                                           :2456
U 1028, 0000,003D,0180,0800,0000,11BC :2457
U 1029, 0000,003C,0180,0800,0000,102A :2458
U 102A, 0000,003D,0180,0800,0000,11A2 :2459
U 102B, 0000,003C,0180,0800,0000,102C :2460
U 102C, 2000,003D,0180,0A08,4200,11D7 :2461
U 102D, 0000,003C,0180,0800,0000,102E :2462
U 102E, 0000,003D,0180,0800,0000,11C1 :2463
U 102F, 0000,003C,0180,0800,0000,1030 :2464
U 1030, 0810,0039,0180,0970,0000,11D1 :2465
U 1031, 001D,A000,0180,0800,0010,11E9 :2466
U 11E9, 0000,013C,0180,0800,0000,1032 :2467
U 1032, 0001,203D,0180,09E8,0000,11A5 :2468
                                           :2469
                                           :2470
                                           :2471
                                           :2472
                                           :2473
                                           :2474
U 1033, 0018,0038,0180,09F0,0000,1034 :2475
U 1034, 0000,003D,0180,0800,0000,11BC :2476
U 1035, 0000,003C,0180,0800,0000,1036 :2477
U 1036, 0000,003D,0180,0800,0000,11A2 :2478
U 1037, 0000,003C,0180,0800,0000,1038 :2479
U 1038, 2000,003D,0180,0A08,4200,11D7 :2480
U 1039, 0000,003C,0180,0800,0000,103A :2481
U 103A, 0000,003D,0180,0800,0000,11C1 :2482
U 103B, 0000,003C,0180,0800,0000,103C :2483
U 103C, 0000,003D,0180,0800,0000,11C5 :2484
U 103D, 0000,003C,0180,0800,0000,103E :2485
U 103E, 0000,003D,0180,0800,0000,11D1 :2486
U 103F, 0810,0038,0180,0970,0000,1040 :2487
U 1040, 0000,003D,0180,0800,0000,11D1 :2488
U 1041, 001D,A000,0180,0800,0010,11EA :2489
U 11EA, 0000,013C,0180,0800,0000,1042 :2490
U 1042, 0001,203D,0180,09E8,0000,11A5 :2491
                                           :2492
                                           :2493
                                           :2494
                                           :2495
                                           :2496
                                           :2497
U 1043, 0000,003C,0180,0A08,0000,1044 :2498
U 1044, 0000,003D,0180,0800,0000,11BC :2499
U 1045, 0018,0014,1180,0A88,0000,1046 :2500
U 1046, 0818,0039,0180,0800,0000,11AF :2501

                                           :2447 R[1]_D ; EQUALS 3C0
                                           :2448 D_K[4],CALL,J/DC3 ; GENERATE ADR OF ADDP4 EXECUTE
                                           :2449 RC[OE]_D ; EQUALS 43
                                           :2450
                                           :2451
                                           :2452
                                           :2453 FIRST CHECK THAT FPD FORCES THE EXEC POINT COUNTER TO ALL ONE'S.
                                           :2454
                                           :2455
                                           :2456
                                           :2457 T127S1: SUBTEST
                                           :2458 NOP
                                           :2459 =0 ERLOOP
                                           :2460 NOP
                                           :2461 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
                                           :2462 NOP
                                           :2463 =0 CALL,J/SETFPD ; SET FIRST PART DONE
                                           :2464 NOP
                                           :2465 -0 CALL,J/DISPAT,D_RC[OE] ; EXECUTE THE SUB/SPEC
                                           :2466 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
                                           :2467 Z?
                                           :2468 =0 ERROR2,RC[OD]_Q ; FPD DID NOT FORCE EXC PNT CTR TO 7
                                           :2469
                                           :2470
                                           :2471
                                           :2472 NOW CHECK THAT THE EXC PNT CTR COUNTS IN VAX MODE.
                                           :2473
                                           :2474
                                           :2475 T127S2: RC[OE]_K[.8] ; SET THE EXPECTED ADDRESS
                                           :2476 =0 SUBTEST
                                           :2477 NOP
                                           :2478 =0 ERLOOP
                                           :2479 NOP
                                           :2480 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
                                           :2481 NOP
                                           :2482 =0 CALL,J/SETFPD ; SET FIRST PART DONE
                                           :2483 NOP
                                           :2484 =0 CALL,J/CLRFDP ; CLEAR FIRST PART DONE
                                           :2485 NOP
                                           :2486 =0 CALL,J/DISPAT ; SHOULD ADVANCE THE CTR TO 0
                                           :2487 D_RC[OE]
                                           :2488 =0 CALL,J/DISPAT ; CHECK THAT EXC PNT CTR WENT TO ZERO
                                           :2489 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
                                           :2490 Z?
                                           :2491 =0 ERROR2,RC[OD]_Q ; CTR DID NOT ADVANCE
                                           :2492
                                           :2493
                                           :2494
                                           :2495 CHECK THAT THE EXC PNT CTR DOES NOT COUNT WHEN 'SRV+INV' IS ASSERTED.
                                           :2496
                                           :2497
                                           :2498 T127S3: LAB_R[1]
                                           :2499 =0 SUBTEST
                                           :2500 R[1]_LA+K[.4] ; SET ADDRESS OF IB DATA
                                           :2501 =0 D_K[.8],CALL,J/DC8 ; GENERATE EXPECTED ADDRESS
    
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U 1047, 0001,003C,0180,09F0,0000,1048 :2502      RC[OE]_D                ; EQUALS 88
U 1048, 0000,003D,0180,0800,0000,11A2 :2503      ERLOOP
U 1049, 0000,003C,0180,0800,0000,104A :2504      NOP
U 104A, 2000,003D,0180,0A08,4200,11D7 :2505      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 104B, 5000,003C,0180,0800,0000,11EB :2506      IBC7CLR.2.3
U 11EB, 5000,003C,0180,0800,0000,11EC :2507      IBC/CLR.2.3
U 11EC, 5000,003C,0180,0800,0000,11ED :2508      IBC/CLR.2.3
U 11ED, 0000,003C,0180,0800,0000,104C :2509      IBC/CLR.1
U 104C, 0000,003D,0180,0800,0000,11D2 :2510      CALL,J/SETCM                ; SET COMPATABILITY MODE
U 104D, 0000,003C,0180,0800,0000,1050 :2511      NOP
U 1050, 0000,003D,0180,0800,0000,11D1 :2512      CALL,J/DISPAT                ; EXC PNT CTR SHOULD NOT INCREMENT
U 1051, 0000,003C,3DF0,2C00,0000,11EE :2513      Q_ID[PSL]                    ; READ THE PSL
U 11EE, 0818,0038,4180,0800,0000,11EF :2514      D_K[.80]                     ; SETUP TO CLEAR CM BIT
U 11EF, 0800,003C,0180,0800,0000,11F0 :2515      D_D.SWAP
U 11F0, 081D,2024,0180,0800,0000,11F1 :2516      D_Q.ANDNOT.D                ; CLEAR THE CM BIT
U 11F1, 0000,003C,3D80,3C00,0000,1052 :2517      ID[PSL]_D                    ; RESTORE THE PSL
U 1052, 0810,0039,0180,0970,0000,11D1 :2518      CALL,J/DISPAT,D RC[OE]        ; CHECK THAT CTR DID NOT COUNT
U 1053, 001D,A000,0180,0800,0010,11F2 :2519      ALU_Q-D,CLK.UBCC,BYTE
U 11F2, 0000,013C,0180,0800,0000,1054 :2520      Z?
U 1054, 0001,203D,0180,09E8,0000,11A5 :2521      ERROR2,RC[OD]_Q            ; EXC PNT CTR CHANGED
:2522
:2523      ;////////////////////////////////////
:2524      ;+
:2525      ; NOW CHECK THAT THE EXC PNT COUNTER ADVANCES IN COMPATABILITY MODE.
:2526      ;-
:2527
U 1055, 0810,0038,0180,0970,0000,11F3 :2528      T127S4: D RC[OE]
U 11F3, 0019,0000,0580,09F0,0000,1056 :2529      RC[OE]_D-K[.1]            ; SET EXPECTED ADDRESS = 87
U 1056, 0000,003D,0180,0800,0000,11BC :2530      SUBTEST
U 1057, 0000,003C,0180,0800,0000,1058 :2531      NOP
U 1058, 0000,003D,0180,0800,0000,11A2 :2532      ERLOOP
U 1059, 0000,003C,0180,0800,0000,105C :2533      NOP
U 105C, 2000,003D,0180,0A08,4200,11D7 :2534      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 105D, 0000,003C,0180,0800,0000,1060 :2535      NOP
U 1060, 0000,003D,0180,0800,0000,11D2 :2536      CALL,J/SETCM                ; SET THE CM BIT IN THE PSL
U 1061, 0000,003C,0180,0800,0000,1062 :2537      NOP
U 1062, 0000,003D,0180,0800,0000,11D1 :2538      CALL,J/DISPAT                ; SHOULD ADVANCE THE EP COUNTER
U 1063, 0000,003C,3DF0,2C00,0000,11F4 :2539      Q_ID[PSL]                    ; READ THE PSL
U 11F4, 0818,0038,4180,0800,0000,11F5 :2540      D_K[.80]                     ; SETUP TO CLEAR THE CM BIT
U 11F5, 0800,003C,0180,0800,0000,11F6 :2541      D_D.SWAP
U 11F6, 081D,2024,0180,0800,0000,11F7 :2542      D_Q.ANDNOT.D                ; CLEAR THE CM BIT
U 11F7, 0000,003C,3D80,3C00,0000,1064 :2543      ID[PSL]_D                    ; RELOAD THE PSL
U 1064, 0810,0039,0180,0970,0000,11D1 :2544      CALL,J/DISPAT,D RC[OE]        ; SEE IF CTR WENT TO POINT 1
U 1065, 001D,A000,0180,0800,0010,11F8 :2545      ALU_Q-D,CLK.UBCC,BYTE        ; CHECK THE ADDRESS
U 11F8, 0000,013C,0180,0800,0000,1066 :2546      Z?
U 1066, 0001,203D,0180,09E8,0000,11A5 :2547      ERROR2,RC[OD]_Q            ; CTR DID NOT ADVANCE
U 1067, 0000,003C,0180,0800,0000,1068 :2548      NOP
    
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:2549 .PAGE "TEST 128 COMPATABILITY MODE A FORK DECODE"
:2550 *****
:2551 ++
:2552 .TEST 128 COMPATABILITY MODE A FORK DECODE
:2553
:2554 .TEST DESCRIPTION
:2555 THIS TEST CHECKS THOSE OPCODES AND LOGIC THAT IS USED TO DECODE
:2556 A COMPATABILITY MODE INSTRUCTION ON THE A FORK. THE TEST OPERATES
:2557 BY LOADING THE IB WITH THE OPCODE, EXECUTING THE SUB/SPEC, AND CHECKING
:2558 THE ADDRESS THAT CAME OUT OF THE IB.
:2559
:2560 THERE ARE 26 OPCODES TESTED IN THIS TEST. THE DATA TABLE AT THE END
:2561 OF THIS TEST DESCRIBES WHAT CLASS EACH OF THE SETS OF OPCODES FALL
:2562 INTO AND THE LOOP COUNT FOR THOSE OPCODES.
:2563
:2564 .LOGIC DESCRIPTION
:2565 THIS TEST CHECKS THE LOGIC THAT DRIVES THE CM DECODE MULTIPLEXORS
:2566 AND THE MUX'S THEMSELVES, AND THE CM DECODE INPUTS TO THE DECODE
:2567 ADDRESS GATES ON THE IRC MODULE.
:2568
:2569 .ERROR DESCRIPTION
:2570 DATA: EXPECTED MICRO PC BITS <7:0>
:2571 RECEIVED MICRO PC BITS <7:0>
:2572 LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE IB.
:2573
:2574 .SYNC POINT DESCRIPTION
:2575 ADDRESS SYNC00--IB ENABLES UPC BITS <7:0> AT THE INSTRUCTION FOLLOWING
:2576 THIS ONE.
:2577 --
:2578 *****
:2579 =0
U 1068, 0000,003D,0180,0800,0000,118E :2580 T128: NEWTST
U 1069, 0018,0038,0D80,09F8,0000,11F9 :2581 RC[0F],K[.3] ; FOUR ARGUMENTS FOR TYPEOUT
U 11F9, 0818,0038,2180,0800,0000,106A :2582 D,K[.14] ; GEN ADR OF IB DATA
U 106A, 0819,0015,0980,0800,0000,11A7 :2583 =0 D-D+K[.2],CALL,J/DCO ; EQUALS 160(16)
U 106B, 0001,003C,0180,0A88,0000,106C :2584 R[1]_D
U 106C, 0818,0039,E580,0800,0000,11A7 :2585 =0 D,K[.1A],CALL,J/DCO ; GEN ADDRESS OF EXP ADDRESS
U 106D, 0001,003C,0180,0A80,0000,11FA :2586 R[0]_D ; EQUALS 1A0(16)
:2587
:2588 ;////////////////////////////////////
:2589 +
:2590 .START THE TEST
:2591 -
:2592
U 11FA, 0018,0038,E580,09E0,0000,11FB :2593 T128S1: RC[0C],K[.1A] ; SET THE LOOP COUNT
U 11FB, 0000,003C,0180,0A00,0200,11FC :2594 T128L1: VA R[0] ; FETCH THE EXPECTED ADDRESS
U 11FC, 0000,803C,0180,C800,0000,11FD :2595 D[BYTE],CACHE.P ;
U 11FD, 0019,0034,4980,09F0,0000,106E :2596 RC[0E]_D.AND,K[.FF] ; SAVE
U 106E, 0000,003D,0180,0800,0000,11A2 :2597 =0 ERLOOP
U 106F, 0000,003C,0180,0800,0000,1070 :2598 NOP
U 1070, 2000,003D,0180,0A08,4200,11D7 :2599 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1071, 0000,003C,0180,0800,0000,1072 :2600 NOP
U 1072, 0000,003D,0180,0800,0000,11D2 :2601 =0 CALL,J/SETCM
U 1073, 0810,0038,0180,0970,0000,1074 :2602 D,RC[0E] ; GET EXPECTED ADDRESS
U 1074, 0000,003D,0180,0800,0000,11D1 :2603 =0 CALL,J/DISPAT ; EXECUTE THE CALL 3

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U 1075,	001D,A000,0180,0800,0010,11FE	:2604	ALU_Q-D,CLK.UBCC,BYTE	:	CHECK ADDRESS
U 11FE,	0000,013C,0180,0800,0000,1076	:2605	Z?	:	BRANCH IF OK
U 1076,	0001,A03D,0180,09E8,0000,11A5	:2606	=0 ERROR2,RC[0D]_Q,BYTE	:	A FORK ADDRESS WRONG
U 1077,	0000,003C,0180,0A00,0000,11FF	:2607	LAB R[0]	:	
U 11FF,	0018,0014,0580,0A80,0000,1300	:2608	R[0] LA+K[.1]	:	INCREMENT ADR OF EXP ADDRESS
U 1300,	0000,003C,0180,0A08,0000,1301	:2609	LAB R[1]	:	
U 1301,	0018,0014,0980,0A88,0000,1302	:2610	R[1] LA+K[.2]	:	INCREMENT ADR OF IB DATA
U 1302,	0810,0038,0180,0960,0000,1303	:2611	D RC[0C]	:	
U 1303,	0019,8000,0580,09E0,0010,1304	:2612	RC[0C]_D-K[.1],CLK.UBCC,BYTE	:	CHECK THE LOOP COUNT
U 1304,	0000,013C,0180,0800,0000,1078	:2613	Z?	:	
U 1078,	0000,003C,0180,0800,0000,11FB	:2614	=0 J/T128L1	:	
U 1079,	0000,003C,0180,0800,0000,107A	:2615	NOP	:	

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:2616
:2617 : FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2618 :X 160
:2619 :   BIN*-SMO*-DMO*EXC CT=0 (EXEC IS FALSE)
:2620 :   LOOP COUNT EQUALS 1A THRU 16
:2621 : $ C388,2548,18E0,19D0,19C8
:2622 :   EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
:2623 :   041610,022510,014340,014720,014710
:2624 :
:2625 :   -(BIN*EXC CT=0*-SMO)*-DMO (EXEC IS FALSE)
:2626 :   LOOP COUNT EQUALS 15 THRU 12
:2627 : $ 0A0E,0A15,0A23,0A27
:2628 :   EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
:2629 :   005016,005025,005043,005047
:2630 :
:2631 :   -(BIN*EXC CT=0*-SMO)*-DMO (EXEC IS FALSE)
:2632 :   LOOP COUNT EQUALS 11
:2633 : $ 4027
:2634 :   EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
:2635 :   040047
:2636 :
:2637 :   -SMO*BIN*-(IR 14:12=0)*EXEC TRUE(DMO*EXC CT=0)
:2638 :   LOOP COUNT EQUALS 10 THRU 0C
:2639 : $ 1200,2400,4800,A200,1207
:2640 :   EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
:2641 :   011000,022000,044000,121000,011007
:2642 :
:2643 :   SINGLE OP*EXEC TRUE(DMO*EXEC CT=0)
:2644 :   LOOP COUNT EQUALS 0B THRU 09
:2645 : $ 8880,8900,0A00
:2646 :   EQUIVALENT OCTAL DATA OF THE ABOVE HEX DATA:
:2647 :   104200,104400,005000
:2648 :
:2649 :   BYTE 1=0*EXEC TRUE(EXC CT=0*-BIN*-REG CLASS*-SINGLE OP)
:2650 :   LOOP COUNT EQUALS 08 THRU 01
:2651 : $ 0008,0001,0002,0004,0010,0020,0040,0080
:2652 :   EQUIVALENT OCTAL DATA OF THE ABOVE HEX DATA
:2653 :   000010,000001,000002,000004,000020,000040,000100,000200
:2654 :
:2655 : THE FOLLOWING IS THE EXPECTED ADDRESS FOR THE ABOVE TEST:
:2656 :X 1A0
:2657 : $ 1211,1C14,011C,0402,0C0C
:2658 :   LOOP COUNT STARTS AT 10

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ZZ-ESKAH-V132 TEST 128 COMPATABILITY MODE A FORK DECODE H 9
ESKAH36.MCR MICRO2 1M(01) 16-DEC-82 12:16:21

SEQ 0931
Page 6

:2659 ;\$ 1211,1114,8811,5398
:2660 : LOOP COUNT STARTS AT 8
:2661 ;\$ 9090,2250,9090,ABDD
:2662
:2663


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:2664 .PAGE "TEST 129 COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE"
:2665 *****
:2666 ++
:2667 TEST 129 COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE
:2668
:2669 TEST DESCRIPTION
:2670 THIS TEST CHECKS THOSE OPCODES THAT REQUIRE THE PSL CONDITION CODES
:2671 TO BE SETUP IN A SPECIFIC CONFIGURATION. THE TEST EXECUTES BY LOADING
:2672 THE INSTRUCTION BUFFER WITH THE OPCODE, LOADING THE CONDITION CODES
:2673 TO THE REQUIRED CONFIGURATION, AND EXECUTING THE SUB/SPEC, AND CHECKING
:2674 THE RESULTING ADDRESS.
:2675 THE DATA AT THE END OF THE TEST SHOWS THE OPCODE AND CONDITION CODE
:2676 VALUES THAT ARE USED FOR EACH PASS THRU THE LOOP.
:2677
:2678 LOGIC DESCRIPTION
:2679 THIS TEST CHECKS THE 'BRANCH COND' SIGNALS FOR COMPATABILITY MODE
:2680 INSTRUCTIONS ON THE IRC MODULE.
:2681
:2682 ERROR DESCRIPTION
:2683 DATA: EXPECTED MICRO PC BITS <7:0>
:2684 RECEIVED MICRO PC BITS <7:0>
:2685 LOOP COUNT -- INDICATES WHICH OPCODE IS BEING TESTED.
:2686
:2687 SYNC POINT DESCRIPTION
:2688 ADDRESS SYNC00-- THE MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
:2689 FOLLOWING THIS ONE.
:2690 --
:2691 *****
:2692 =0
:2693 T129: NEWTST
:2694 RC[0F] K[.3]
:2695 D_K[.1A] Q ALU
:2696 =0 D_D+K[.2],CALL,J/DCO ; GEN ADDRESS OF IB DATA
:2697 R[1] D,D Q ; EQUALS 1C(16)
:2698 =0 D_D+K[.3],CALL,J/DCC ; GEN ADDRESS OF EXPECTED ADDRESS
:2699 R[0] D ; EQUALS 1DC(16)
:2700 =0 D_K[.1E],CALL,J/DCC ; GEN ADDRESS OF COND CODE DATA
:2701 R[2] D ; EQUALS 1EC(16)
:2702
:2703 ;////////////////////
:2704 ;+
:2705 ; START THE TEST
:2706 ;-
:2707
:2708 T129S1: RC[0C] K[.D] ; SET THE LOOP COUNT
:2709 T129L1: VA R[0] ; FETCH EXPECTED ADDRESS
:2710 D[BYTE] CACHE.P ;
:2711 RC[0E] D.AND.K[.FF] ; SAVE
:2712 VA R[2] ; FETCH CONDITION CODE DATA
:2713 D[BYTE] CACHE.P ;
:2714 D_D.AND.K[.F],R[3]_ALU ; MASK AND SAVE
:2715 =0 ERLOOP ;
:2716 D_R[3] ; GET CC DATA
:2717 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2718 Q_IB[PSL] ; GET THE PSL

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U 107A, 0000,003D,0180,0800,0000,118E
U 107B, 0018,0038,0D80,09F8,0000,1305
U 1305, 0818,0038,E5C0,0800,0000,107C
U 107C, 0819,0015,0980,0800,0000,11A7
U 107D, 0C01,003C,0180,0A88,0000,107E
U 107E, 0819,0015,0D80,0800,0000,11B3
U 107F, 0001,003C,0180,0A80,0000,1080
U 1080, 0818,0039,5180,0800,0000,11B3
U 1081, 0001,003C,0180,0A90,0000,1306

U 1306, 0018,0038,8980,09E0,0000,1307
U 1307, 0000,003C,0180,0A00,0200,1308
U 1308, 0000,803C,0180,C800,0000,1309
U 1309, 0019,0034,4980,09F0,0000,130A
U 130A, 0000,003C,0180,0A10,0200,130B
U 130B, 0000,803C,0180,C800,0000,130C
U 130C, 0819,0034,6180,0A98,0000,1082
U 1082, 0000,003D,0180,0800,0000,11A2
U 1083, 0800,003C,0180,0A18,0000,1084
U 1084, 2000,003D,0180,0A08,4200,11D7
U 1085, 0000,003C,3DF0,2C00,0000,130D

U 130D,	0019,2024,61C0,0800,0000,130E	:2719	Q-Q.ANDNOT.K[F]	; MASK THE PSL
U 130E,	081D,0030,0180,0800,0000,130F	:2720	D-D.OR.Q	; INSERT CC'S
U 130F,	0000,003C,3D80,3C00,0000,1086	:2721	ID[PSL] D	; LOAD THE CC'S
U 1086,	0000,003D,0180,0800,0000,11D2	:2722	=0 CALL J/SETCM	
U 1087,	0810,0038,0180,0970,0000,1088	:2723	D RC[0E]	; GET EXPECTED DATA
U 1088,	0000,003D,0180,0800,0000,11D1	:2724	=0 CALL J/DISPAT	; EXECUTE TEN CALL 3
U 1089,	001D,A000,0180,0800,0010,1310	:2725	ALU-Q-D,CLK.UBCC,BYTE	; CHECK THE ADDRESS
U 1310,	0000,013C,0180,0800,0000,108A	:2726	Z?	
U 108A,	0001,A03D,0180,09E8,0000,11A5	:2727	=0 ERROR2,RC[0D]-Q,BYTE	; A FORK FAILED
U 108B,	0000,003C,0180,0A00,0000,1311	:2728	LAB R[0]	
U 1311,	0018,0014,0580,0A80,0000,1312	:2729	R[0] LA+K[.1]	; INCREMENT ADR OF EXP ADDRESS
U 1312,	0000,003C,0180,0A08,0000,1313	:2730	LAB R[1]	
U 1313,	0018,0014,0980,0A88,0000,1314	:2731	R[1] LA+K[.2]	; INCREMENT ADR OF IB DATA
U 1314,	0000,003C,0180,0A10,0000,1315	:2732	LAB R[2]	
U 1315,	0018,0014,0580,0A90,0000,1316	:2733	R[2] LA+K[.1]	; INCREMENT ADR OF CC DATA
U 1316,	0810,0038,0180,0960,0000,1317	:2734	D RC[0C]	
U 1317,	0019,8000,0580,09E0,0010,1318	:2735	R[0C]-D-K[.1],CLK.UBCC,BYTE	; CHECK THE LOOP COUNT
U 1318,	0000,013C,0180,0800,0000,108C	:2736	Z?	
U 108C,	0000,003C,0180,0800,0000,1307	:2737	=0 J/T129L1	
U 108D,	0000,003C,0180,0800,0000,108E	:2738	NOP	

```

:2739
:2740
:2741 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2742 ; X 1C0
:2743 ; LOOP COUNT EQUALS 0D THRU 07
:2744 ; $ 8200,8200,8200,8000,8000,8400,8400
:2745 ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2746 ; 101000,101000,101000,100000,100000,102000,102000
:2747
:2748 ; LOOP COUNT EQUALS 06 THRU 01
:2749 ; $ 0400,0400,0400,0200,0200,0100
:2750 ; OCTAL EQUIVALENT OF THE ABOVE HEX DATA:
:2751 ; 002000,002000,002000,001000,001000,000400
:2752
:2753 ; THE FOLLOWING IS THE EXPECTED ADDRESS FOR THE ABOVE TEST:
:2754 ; X 1DC
:2755 ; $ A1A0,A0A1,A0A1,A2A1,A0A2,A0A2,00A6
:2756
:2757 ; THE FOLLOWING IS THE CONDITION CODE DATA FOR THE ABOVE TEST:
:2758 ; X 1EC
:2759 ; EACH PASS THRU THE LOOP USES ONE BYTE OF THIS DATA
:2760 ; $ 0100,0004,0008,0802,0002,0004,0000
:2761
:2762
    
```

```

:2763 .PAGE 'TEST 12A COMPATABILITY MODE B FORK DECODE'
:2764 *****
:2765 ++
:2766 TEST 12A COMPATABILITY MODE B FORK DECODE
:2767
:2768 TEST DESCRIPTION
:2769 THIS TEST CHECKS 22 OPCODES WITH THE EXECUTION POINT COUNTER
:2770 EQUAL TO 1. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
:2771 A SUB/SPEC FUNCTION TO ADVANCE THE EXECUTION POINT COUNTER TO 1, THEN
:2772 EXECUTING ANOTHER SUB/SPEC AND CHECKING THE ADDRESS.
:2773 THE DATA TABLE AT THE END OF THIS TEST DESCRIBES THE LOGICAL DECODE
:2774 OF THE OPCODES.
:2775
:2776 LOGIC DESCRIPTION
:2777 THIS TEST CHECKS MORE OF THE LOGIC THAT FEEDS THE 'CM DECODE
:2778 MULTIPLEXORS' ON THE IRC MODULE.
:2779
:2780 ERROR DESCRIPTION
:2781 DATA: EXPECTED MICRO PC BITS <7:0>
:2782 RECEIVED MICRO PC BITS <7:0>
:2783 LOOP COUNT -- DESCRIBES WHICH OPCODE IS BEING TESTED.
:2784
:2785 SYNC POINT DESCRIPTION
:2786 ADDRESS SYNC00--THE MICRO PC BITS ARE VALID AT THE INSTRUCTION
:2787 FOLLOWING THIS ONE.
:2788
:2789 *****
:2790 =0
:2791 T12A: NEWTST
:2792 RC[OF],K[.3] ; FOUR ARGUMENTS FOR TYPEOUT
:2793 =0 D_K[.20],CALL,J/DCO ; GEN ADDRESS OF IB DATA
:2794 R[1],D ; EQUALS 200(16)
:2795 D_K[.24]
:2796 =0 D-D-K[.1],CALL,J/DCO ; GEN ADDRESS OF EXP ADDRESS
:2797 R[0],D ; EQUALS 230(16)
:2798
:2799 ;////////////////////
:2800 +
:2801 START THE TEST
:2802 -
:2803
:2804 T12AS1: D_K[.14]
:2805 RC[OC],D+K[.2] ; SET THE LOOP COUNT
:2806 T12AL1: VA R[0] ; FETCH THE EXPECTED ADDRESS
:2807 D[BYTE],CACHE.P
:2808 RC[OE],D.AND,K[.FF] ; SAVE
:2809 =0 ERLOOP
:2810 NOP
:2811 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2812 NOP
:2813 =0 CALL,J/SETCH
:2814 D_RC[OE] ; GET EXPECTED DATA
:2815 =0 CALL,J/DISPAT ; EXECUTE THE A FORK
:2816 NOP
:2817 =0 CALL,J/DISPAT ; EXECUTE THE B FORK

```

U 108E, 0000,003D,0180,0800,0000,118E
U 108F, 0018,0038,0D80,09F8,0000,1090
U 1090, 0818,0039,7580,0800,0000,11A7
U 1091, 0001,003C,0180,0A88,0000,1319
U 1319, 0818,0038,E980,0800,0000,1092
U 1092, 0819,0001,0580,0800,0000,11A7
U 1093, 0001,003C,0180,0A80,0000,131A

U 131A, 0818,0038,2180,0800,0000,131B
U 131B, 0019,0014,0980,09E0,0000,131C
U 131C, 0000,003C,0180,0A00,0200,131D
U 131D, 0000,803C,0180,C800,0000,131E
U 131E, 0019,0034,4980,09F0,0000,1094
U 1094, 0000,003D,0180,0800,0000,11A2
U 1095, 0000,003C,0180,0800,0000,1096
U 1096, 2000,003D,0180,0A08,4200,11D7
U 1097, 0000,003C,0180,0800,0000,1098
U 1098, 0000,003D,0180,0800,0000,11D2
U 1099, 0810,0038,0180,0970,0000,109A
U 109A, 0000,003D,0180,0800,0000,11D1
U 109B, 0000,003C,0180,0800,0000,109C
U 109C, 0000,003D,0180,0800,0000,11D1

```

U 109D, 001D, A000, 0180, 0800, 0010, 131F :2818 ALU_Q-D, CLK.UBCC, BYTE ; CHECK THE ADDRESS
U 131F, 0000, 013C, 0180, 0800, 0000, 109E :2819 Z?
U 109E, 0001, A03D, 0180, 09E8, 0000, 11A5 :2820 =0 ERROR2, RC[0D]_Q, BYTE ; B FORK FAILED
U 109F, 0000, 003C, 0180, 0A00, 0000, 1320 :2821 LAB R[0]
U 1320, 0018, 0014, 0580, 0A80, 0000, 1321 :2822 RC[0] LA+K[.1] ; INCREMENT ADR OF EXP ADDRESS
U 1321, 0000, 003C, 0180, 0A08, 0000, 1322 :2823 LAB R[1]
U 1322, 0018, 0014, 0980, 0A88, 0000, 1323 :2824 RC[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
U 1323, 0810, 0038, 0180, 0960, 0000, 1324 :2825 D RC[0C]
U 1324, 0019, 8000, 0580, 09E0, 0010, 1325 :2826 RC[0C]_D-K[.1], CLK.UBCC, BYTE ; CHECK THE LOOP COUNT
U 1325, 0000, 013C, 0180, 0800, 0000, 10A0 :2827 Z?
U 10A0, 0000, 003C, 0180, 0800, 0000, 131C :2828 =0 J/T12AL1
U 10A1, 0000, 003C, 0180, 0800, 0000, 10A2 :2829 NOP

```

```

:2830
:2831 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2832 :X 200
:2833 : EXC CT=1*DM0*-SM0*BIN*SRC R=PC*SM2
:2834 : LOOP COUNT EQUALS 16 THRU 13
:2835 : $ 95C7,65C7,55C7,25C7
:2836 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2837 : 112707,062707,052707,022707
:2838
:2839 : EXC CT=1*DM0*-SM0*BIN*-SRC R=PC*SM2
:2840 : LOOP COUNT EQUALS 12
:2841 : $ 9407
:2842 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2843 : 112007
:2844
:2845 : -(EXC CT=0*-SM0*BIN)*SRC R=PC*-SM2*DM0
:2846 : LOOP COUNT EQUALS 11 THRU 0F
:2847 : $ 9DC7,93C7,99C7
:2848 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2849 : 116707,111707,114707
:2850
:2851 : BIN*EXEC TRUE(EXC CT=1*SM0)
:2852 : LOOP COUNT EQUALS 0E
:2853 : $ 5000
:2854 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2855 : 050000
:2856
:2857 : -DM0*EXEC TRUE(EXC CT=1*REG CLASS)
:2858 : LOOP COUNT EQUALS 0D THRU 0C
:2859 : $ 7608,7808
:2860 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2861 : 073010,074010
:2862
:2863 : -SM0*EXEC FALSE(EXC CT=1*BIN)
:2864 : LOOP COUNT EQUALS 0B THRU 05
:2865 : $ 3608,5608,1608,F608,7E08,7A08,7C08
:2866 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2867 : 033010,053010,013010,073010,077010,075010,076010
:2868
:2869 : -SM0*-DM0*EXEC TRUE(EXC CT=1*SINGLE OP)
:2870 : LOOP COUNT EQUALS 04 THRU 01
:2871 : $ 0BC8,0C08,8988,8C48
:2872 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:

```


ZZ-ESKAH-V132 TEST 12A COMPATABILITY MODE B FORK DECODE
ESKAH36.MCR MICRO2 1M(01) 16-DEC-82 12:16:21

M 9

SEQ 0936
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:2873 : 005710,006010,104610,106110
:2874 :
:2875 :
:2876 : THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:2877 :% 230
:2878 :\$ F4F9,BFF4,F9F9,F9F9,AC74,0164,0101,0101
:2879 :\$ 0101,C72F,E401
:2880 :
:2881 :

```

2882 .PAGE "TEST 12B COMPATABILITY MODE C FORK DECODE"
2883 *****
2884 ++
2885 TEST 12B COMPATABILITY MODE C FORK DECODE
2886
2887 TEST DESCRIPTION
2888 THIS TEST CHECKS THAT THE 'EXEC' SIGNAL GOES TRUE WHEN THE
2889 EXECUTION POINT COUNTER EQUALS 2. THIS IS DONE BY LOADING THE
2890 IB WITH AN OPCODE, EXECUTING TWO SUB/SPEC TO ADVANCE THE EXECUTION
2891 POINT COUNTER TO 2, AND THEN EXECUTING ANOTHER SUB/SPEC AND CHECKING
2892 THE ADDRESS.
2893
2894 LOGIC DESCRIPTION
2895 THIS TEST CHECKS PART OF THE GATE THAT GENERATES THE 'EXEC' SIGNAL
2896 ON THE IRC MODULE.
2897
2898 ERROR DESCRIPTION
2899 DATA: EXPECTED MICRO PC BITS <7:0>
2900 RECEIVED MICRO PC BITS <7:0>
2901
2902 SYNC POINT DESCRIPTION
2903 ADDRESS SYNC00--MICRO PC BITS <7:0> ARE ACTIVE AT THE INSTRUCTION
2904 FOLLOWING THIS ONE.
2905 --
2906 *****
2907 =0
2908 T12B: NEWTST
2909 RC[0F] K[.2]
2910 D_K[.2]
2911 =0 D-D+K[.1],CALL,J/DCO,Q_ALU ; GEN ADDRESS OF IB DATA
2912 RC[1] D ; EQUALS 250(16)
2913 D_K[.20] ; GEN EXPECTED DISPATCH ADDRESS
2914 KMX/.F
2915 RC[0E]_D+K[F] ; SAVE
2916
2917 //////////////////////////////////////
2918 +
2919 START THE TEST
2920 --
2921
2922 =0 ERLOOP
2923 NOP
2924 =0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
2925 NOP
2926 =0 CALL,J/SETCM
2927 D_RC[0E]
2928 =0 CALL,J/DISPAT ; EXECUTE A FORK
2929 NOP
2930 =0 CALL,J/DISPAT ; EXECUTE B FORK
2931 NOP
2932 =0 CALL,J/DISPAT ; EXECUTE THE C FORK
2933 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
2934 Z?
2935 =0 ERROR1,RC[0D]_Q,BYTE ; C FORK FAILED
2936 NOP

```

U 10A2, 0000,003D,0180,0800,0000,118E
U 10A3, 0018,0038,0980,09F8,0000,1326
U 1326, 0818,0038,E980,0800,0000,10A4
U 10A4, 0819,0015,05C0,0800,0000,11A7
U 10A5, 0001,003C,0180,0A88,0000,1327
U 1327, 0818,0038,7580,0800,0000,1328
U 1328, 0000,003C,6180,0800,0000,1329
U 1329, 0019,0014,6180,09F0,0000,10A6

U 10A6, 0000,003D,0180,0800,0000,11A2
U 10A7, 0000,003C,0180,0800,0000,10A8
U 10A8, 2000,003D,0180,0AD8,4200,11D7
U 10A9, 0000,003C,0180,0800,0000,10AA
U 10AA, 0000,003D,0180,0800,0000,11D2
U 10AB, 0810,0038,0180,0970,0000,10AC
U 10AC, 0000,003D,0180,0800,0000,11D1
U 10AD, 0000,003C,0180,0800,0000,10AE
U 10AE, 0000,003D,0180,0800,0000,11D1
U 10AF, 0000,003C,0180,0800,0000,10B0
U 10B0, 0000,003D,0180,0800,0000,11D1
U 10B1, 001D,A000,0180,0800,0010,132A
U 132A, 0000,013C,0180,0800,0000,10B2
U 10B2, 0001,A03D,0180,09E8,0000,11A3
U 10B3, 0000,003C,0180,0800,0000,10B4

ZZ-ESKAM-V132 TEST 12B COMPATABILITY MODE C FORK DECODE
ESKAM36.MCR MICRC2 1M(01) 16-DEC-82 12:16:21

:2937
:2938 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2939 :X 250
:2940 : -DMO*EXEC TRUE(EXC CT=2)
:2941 :S 3008
:2942 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2943 : 030010
:2944
:2945

```

:2946 .PAGE "TEST 12C COMPATABILITY MODE STALL LOGIC"
:2947 *****
:2948 ++
:2949 TEST 12C COMPATABILITY MODE STALL LOGIC
:2950
:2951 TEST DESCRIPTION
:2952 THIS TEST CHECKS THE TWO CONDITIONS THAT ARE UNIQUE TO COMPATABILITY
:2953 MODE THAT CAN CAUSE THE IB TO STALL.
:2954
:2955 SUBTST 1 - CHECK THAT BYTE 1 INVALID AND 'NOT EXEC' CAUSES A STALL.
:2956 SUBTST 2 - CHECK THAT BYTE 2 INVALID AND AN INSTRUCTION WITH A PC
:2957 MODE CAUSES A STALL.
:2958
:2959 LOGIC DESCRIPTION
:2960 THIS TEST CHECKS PART OF THE LOGIC THAT GENERATES "STALL+SVC"
:2961 ON THE IRC MODULE.
:2962
:2963 ERROR DESCRIPTION
:2964 DATA: EXPECTED MICRO PC BITS <7:0>
:2965 RECEIVED MICRO PC BITS <7:0>
:2966
:2967 SYNC POINT DESCRIPTION
:2968 ADDRESS SYNC00--MICRO PC BITS ARE VALID AT THE INSTRUCTION FOLLOWING
:2969 THIS ONE.
:2970 --
:2971 *****
:2972 =0
:2973 T12C: NEWTST
:2974 RC[0F],K[.2]
:2975 D,K[.20]
:2976 KMX/.A ; GEN ADR OF IB DATA
:2977 =0 D,D+K[.A],CALL,J/DCE ; EQUALS 2AE(16)
:2978 RC[1],D ; SAVE
:2979 =0 SUBTEST
:2980 D,K[.7C] ; GEN STALL ADDRESS
:2981 RC[0E],D+K[.2] ; EQUALS 7E(16)
:2982
:2983 :////////////////////
:2984 :+
:2985 : CHECK THAT BYTE 1 INVALID CAUSES A STALL
:2986 :-
:2987
:2988 T12CS1:
:2989 =0 ERLOOP
:2990 NOP
:2991 =0 ALU,RC[1],FLUSH.IB,CALL,J/IBWAITONCE ; READ 2 BYTES
:2992 NOP
:2993 =0 CALL,J/SETCM ; SET CM BIT
:2994 D,RC[0E]
:2995 IBCLCLR.1 ; MAKE BYTE 1 INVALID
:2996 =0 CALL,J/DISPAT ; EXECUTE TEN A FORK
:2997 ALU,Q-D,CLK.UBCC,BYTE ; CHECK
:2998 Z?
:2999 =0 ERROR1,RC[0D],Q,BYTE ; STALL FAILED
:3000

```

U 10B4, 0000,003D,0180,0800,0000,118E
 U 10B5, 0018,0038,0980,09F8,0000,132B
 U 132B, 0818,0038,7580,0800,0000,132C
 U 132C, 0000,003C,F580,0800,0000,10B6
 U 10B6, 0819,0015,F580,0800,0000,11B5
 U 10B7, 0001,003C,0180,0A88,0000,10B8
 U 10B8, 0000,003D,0180,0800,0000,11BC
 U 10B9, 0818,0038,9D80,0800,0000,132D
 U 132D, 0019,0014,0980,09F0,0000,10BA

U 10BA, 0000,003D,0180,0800,0000,11A2
 U 10BB, 0000,003C,0180,0800,0000,10BC
 U 10BC, 2000,003D,0180,0A08,4200,11DE
 U 10BD, 0000,003C,0180,0800,0000,10BE
 U 10BE, 0000,003D,0180,0800,0000,11D2
 U 10BF, 0810,0038,0180,0970,0000,132E
 U 132E, D000,003C,0180,0800,0000,10C0
 U 10C0, 0000,003D,0180,0800,0000,11D1
 U 10C1, 001D,A000,0180,0800,0010,132F
 U 132F, 0000,013C,0180,0800,0000,10C2
 U 10C2, 0001,A03D,0180,09E8,0000,11A3


```

:3001 ://////////////////////////////////////////////////
:3002 :+
:3003 : NOW CHECK THAT BYTE 2 INVALID CAUSES STALL
:3004 :-
:3005
U 10C3, 0000,003C,0180,0A08,0000,10C4 :3006 T12CS2: LAB R[1]
U 10C4, 0000,003D,0180,0800,0000,11BC :3007 =0 SUBTEST
U 10C5, 0018,0014,1180,0A88,0000,10C6 :3008 R[1] LA+K[.4] ; INCREMENT ADR OF IB DATA
U 10C6, 0000,003D,0180,0800,0000,11A2 :3009 =0 ERLOOP
U 10C7, 0000,003C,0180,0800,0000,10C8 :3010 NOP
U 10C8, 2000,003D,0180,0A08,4200,11DE :3011 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD 2 BYTES
U 10C9, 0000,003C,0180,0800,0000,10CA :3012 NOP
U 10CA, 0000,003D,0180,0800,0000,11D2 :3013 =0 CALL,J/SETCM ; SET CM BIT
U 10CB, 0810,0038,0180,0970,0000,10CC :3014 D RC[OE]
U 10CC, 0000,003D,0180,0800,0000,11D1 :3015 =0 CALL,J/DISPAT ; EXECUTE THE CALL 3
U 10CD, 001D,A000,0180,0800,0010,1330 :3016 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1330, 0000,013C,0180,0800,0000,10CE :3017 Z?
U 10CE, 0001,A03D,0180,09E8,0000,11A3 :3018 =0 ERROR1,RC[OD]_Q,BYTE ; STALL FAILED
U 10CF, 0000,003C,0180,0800,0000,10D0 :3019 NOP
:3020
:3021 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3022 :% 2AE
:3023 : SUBTEST 1
:3024 :$ 0000
:3025
:3026 :% 2B2
:3027 : SUBTEST 2
:3028 :$ 15DF
:3029 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3030 : 012757
:3031
:3032

```

```

PAGE 'TEST 12D COMPATABILITY MODE D MUX SELECT'
*****
++
TEST 12D COMPATABILITY MODE D MUX SELECT

TEST DESCRIPTION
THIS TEST CHECKS 20 OPCODES AND THEIR RESPECTIVE D MUX DATA.
THE TEST DATA AT THE END OF THIS TEST DESCRIBES THE OPCODES.

SUBTST 1 - CHECK 15 OPCODES AT EXECUTION POINT 0
SUBTST 2 - CHECK 1 OP CODE AT EXECUTION POINT 1
SUBTST 3 - CHECK 4 OP CODES AT EXECUTION POINT 4
THE IB DATA AND EXPECTED DATA FOR THIS TEST IS
AT THE END OF THIS OVERLAY.

NOTE: SUBTEST 3 DATA IS AT THE END OF TEST 12F.

LOGIC DESCRIPTION
THIS TEST CHECKS THE LOGIC THAT GENERATES THE SELECT BYTE AND
SELECT WORD SIGNALS ON THE IRC MODULE IN COMPATABILITY MODE.

ERROR DESCRIPTION
DATA: EXPECTED D MUX DATA
RECEIVED D MUX DATA
LOOP COUNT -- DESCRIBES WHICH OPCODE IS CURRENTLY IN THE IB.

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC02--D MUX IS READ INTO THE Q REGISTER
SUBTST 2 - SYNC06--D MUX IS READ INTO THE Q REGISTER
--
*****
=0
T12D: NEWTST
RC[0F] K[.3]
D_K[.24] ; GEN ADR OF IB DATA
=0 D_D+K[.8],CALL,J/DC0 ; EQUALS 2C0(16)
RC[1] D ; SAVE
D_K[.30] ; GEN ADR OF EXPECTED DATA
=0 D_D+K[.4],CALL,J/DC0 ; EQUALS 330(16)
RC[0]_D

////////////////////////////////////
+
START THE TEST
-

T12DS1: RC[0C] K[.F] ; SET THE LOOP COUNT
=0 SUBTEST
T12DL1: VA RC[0] ; LOAD ADR OF EXP DATA
D[CONG] CACHE.P ; FETCH THE EXPECTED DATA
RC[0E] D ; SAVE
=0 ERLOOP
NOP
=0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
NOP
    
```

U 10D0, 0000,003D,0180,0800,0000,118E
 U 10D1, 0018,0038,0D80,09F8,0000,1331
 U 1331, 0818,0038,E980,0800,0000,10D2
 U 10D2, 0819,0015,0180,0800,0000,11A7
 U 10D3, 0001,003C,0180,0A88,0000,1332
 U 1332, 0818,0038,7980,0800,0000,10D4
 U 10D4, 0819,0015,1180,0800,0000,11A7
 U 10D5, 0001,003C,0180,0A80,0000,1333

U 1333, 0018,0038,6180,09E0,0000,10D6
 U 10D6, 0000,003D,0180,0800,0000,118C
 U 10D7, 0000,003C,0180,0A00,0200,1334
 U 1334, 0000,003C,0180,C800,0000,1335
 U 1335, 0001,003C,0180,09F0,0000,10D8
 U 10D8, 0000,003D,0180,0800,0000,11A2
 U 10D9, 0000,003C,0180,0800,0000,10DA
 U 10DA, 2000,003D,0180,0A08,4200,11D7
 U 10DB, 0000,003C,0180,0800,0000,10DC

```

U 10DC, 0000,003D,0180,0800,0000,11D2 :3088 =0 CALL J/SETCM ; TURN ON CM
U 10DD, 0810,0038,0180,0970,0000,1336 :3089 D-RC[0E]
U 1336, 0000,003C,01F0,2C00,0000,1337 :3090 SYNC02: Q-ID[IBUF] ; READ THE D MUX
U 1337, 001D,2000,0180,0800,0010,1338 :3091 A[U-Q-D,CLK.UBCC ; CHECK
U 1338, 0000,013C,0180,0800,0000,10DE :3092 Z?
U 10DE, 0001,203D,0180,09E8,0000,11A5 :3093 =0 ERROR2,RC[0D],Q ; D MUX FAILED
U 10DF, 0000,003C,0180,0A00,0000,1339 :3094 LAB R[0]
U 1339, 0018,0014,1180,0A80,0000,133A :3095 R[0],LA+K[.4] ; INCREMENT ADR OF EXP DATA
U 133A, 0000,003C,0180,0A08,0000,133B :3096 LAB R[1]
U 133B, 0018,0014,0180,0A88,0000,133C :3097 R[1],LA+K[.8] ; INCREMENT ADR OF IB DATA
U 133C, 0810,0038,0180,0960,0000,133D :3098 D-RC[0C]
:3099 R[0C],D-K[.1],D,ALU, ; CHECK THE LOOP COUNT
:3100 CLK.UBCC,BYTE
:3101 Z?
U 133D, 0819,8000,0580,09E0,0010,133E :3102 =0 J/T12D,S1_ECO,K[.C] ; GO TO NEXT SUBTEST
U 133E, 0000,013C,0180,0800,0000,10E0 :3103 J/T12DS2
U 10E0, 0000,003C,8580,0800,0000,133F :3104 T12D_S1_ECO: ; AT 'TWINKLE' PATTERNS?
U 10E1, 0000,003C,0180,0800,0000,10E4 :3105 ALU_D-K[.C],CLK.UBCC,BYTE
:3106 Z?
:3107 =0 J/T12DL1 ; BRANCH IF NO
:3108
:3109 ; CHECK IF THIS SYSTEM HAS BEEN ECO'D
:3110
:3111 NOP
U 10E3, 0000,003C,0180,0800,0000,1008 :3112 =00 CALL[CHECK_TWINKLE] ; CHECK FOR TWINKLE ECO
U 1008, 0000,003D,0180,0800,0000,11C9 :3113 J/T12DL1 ; BRANCH IF ECO INSTALLED
U 1009, 0000,003C,0180,0800,0000,10D7 :3114
:3115 ; MACHINE IS NOT 'TWINKLED', SKIP 3 TEST PATTERNS
:3116
:3117 R[0C],D-K[.3] ; FIXUP LOOP COUNT
U 100A, 0019,0000,0D80,09E0,0000,1341 :3118 = LAB R[0],K[.C] ; FIXUP ADDRESS OF EXPECTED DATA
U 1341, 0000,003C,8580,0A00,0000,1342 :3119 R[0],LA+K[.C]
U 1342, 0018,0014,8580,0A80,0000,1343 :3120 LAB R[1] ; FIXUP ADDRESS OF IB DATA
U 1343, 0000,003C,0180,0A08,0000,1344 :3121 R[1],LA+K[.18],J/T12DL1 ; AND CONTINUE TEST
U 1344, 0018,0014,7D80,0A88,0000,10D7 :3122
:3123 ;////////////////////
:3124 ;+
:3125 ; CHECK THE OPCODE THAT REQUIRES THE EXECUTION POINT COUNTER TO BE NON ZERO.
:3126 ;-
:3127
:3128 =0
:3129 T12DS2: SUBTEST
U 10E4, 0000,003D,0180,0800,0000,11BC :3130 VA R[0] ; LOAD ADDRESS OF EXPECTED DATA
U 10E5, 0000,003C,0180,0A00,0200,1345 :3131 D[ONG] CACHE.P ; READ THE EXPECTED DATA
U 1345, 0000,003C,0180,C800,0000,1346 :3132 R[0E],D ; SAVE
U 1346, 0001,003C,0180,09F0,0000,10E6 :3133 =0 ERLOOP
U 10E6, 0000,003D,0180,0800,0000,11A2 :3134 NOP
U 10E7, 0000,003C,0180,0800,0000,10E8 :3135 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10E8, 2000,003D,0180,0A08,4200,11D7 :3136 NOP
U 10E9, 0000,003C,0180,0800,0000,10EA :3137 =0 CALL J/SETCM ; SET THE CM BIT
U 10EA, 0000,003D,0180,0800,0000,11D2 :3138 D-RC[0E] ; GET EXPECTED D MUX DATA
U 10EB, 0810,0038,0180,0970,0000,10EC :3139 =0 CALL J/DISPAT ; GO TO EXEC PT 1
U 10EC, 0000,003D,0180,0800,0000,11D1 :3140 SYNC06: Q-ID[IBUF] ; READ THE D MUX
U 10ED, 0000,003C,01F0,2C00,0000,1347 :3141 A[U-Q-D,CLK.UBCC ; CHECK
U 1347, 001D,2000,0180,0800,0010,1348 :3142 Z?
U 1348, 0000,013C,0180,0800,0000,10EE :3142

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U 10EE, 0001,203D,0180,09E8,0000,11A5 :3143 =0 ERROR2,RC[0D]_Q ; D MUX SELECT FAILED
U 10EF, 0000,003C,0180,0800,0000,10F0 :3144 NOP
:3145
:3146
:3147 :////////////////////
:3148 :+
:3149 : CHECK 4 OPCODES THAT REQUIRE THE EXECUTION POINT COUNTER TO BE AT 4
:3150 :-
:3151
:3152 =0
:3153 T12DS3: SUBTEST
:3154 Q ID[PSL] ; CLEAR THE COMPATABILITY
:3155 SC K[.1F] ; MODE BIT IN THE
:3156 D Q.AND.MASK ; PSL
:3157 ID[PSL] D
:3158 RC[0C] R[.4] ; SET THE LOOP COUNT
:3159 D K[.40] ; GENERATE ADDRESS OF IB DATA
:3160 =0 D-D+K[.1],CALL[DC0] ; EQUALS 410(H)
:3161 RC[0] D,KMX/.20 ; SAVE
:3162 VA A[U,ALU D+K[.20] ; LOAD ADR OF EXPECTED DATA
:3163 D[LONG] CACHE.P ; GET EXPECTED DATA
:3164 RC[0E] D ; SAVE
:3165 =0 ERLOOP-
:3166 T12DL2: NOP
:3167 =0 ALU_R[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB WITH DATA
:3168 NOP
:3169 =0 CALL[SETCM] ; SET THE CM BIT
:3170 NOP
:3171 =0 CALL[DISPAT] ; GO TO EXECUTION POINT 1
:3172 D RC[0E] ; GET EXPECTED DMUX DATA
:3173 =0 CALL[DISPAT] ; GO TO EXECUTION POINT 2
:3174 NOP
:3175 =0 CALL[DISPAT] ; GO TO EXECUTION POINT 3
:3176 NOP
:3177 =0 CALL[DISPAT] ; GO TO EXECUTION POINT 4
:3178 Q ID[IBUF] ; READ THE DMUX
:3179 A[U_Q-D,CLK.UBCC ; CHECK IF CORRECT
:3180 Z?
:3181 =0 ERROR2,RC[0D]_Q ; DMUX SELECTED WRONG
:3182 LAB R[0] ; LATCH ADR OF IB DATA
:3183 RC[0] LA+K[.8] ; INCREMENT FOR NEXT TIME THRU LOOP
:3184 D RC[0C] ; GET THE LOOP COUNT
:3185 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DONE YET?
:3186 Z?
:3187 =0 J/T12DL2 ; NO, CHECK NEXT PATTERN
:3188 NOP
:3189 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3190 ;% 2C0
:3191 ; LOOP COUNT EQUALS F THRU 1, EACH PASS THRU LOOP READS TWO LONG WORDS
:3192 ;$ 1030,5555,FFFF,0000
:3193 ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3194 ; 010060,052525,177777,000000
:3195 ;
:3196 ;$ 7817,AAAA,0000,0000
:3197 ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:

```



```

:3198 : 074027,125252,000000,000000
:3199 : $ 0A17,5555,FFFF,0000
:3200 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3201 : 005027,052525,177777,000000
:3202 :
:3203 : TWINKLE ECO IN FEBRUARY 1981
:3204 : *****
:3205 : $ 0C17,5555,FFFF,0000
:3206 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3207 : 006027,052525,177777,000000
:3208 : $ 0D97,5555,FFFF,0000
:3209 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3210 : 006627,052525,177777,000000
:3211 : $ 0E17,5555,FFFF,0000
:3212 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3213 : 007027,052525,177777,000000
:3214 : *****
:3215 :
:3216 : $ 1C28,AAAA,0000,0000
:3217 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3218 : 016050,125252,000000,000000
:3219 : $ 15E8,5555,FFFF,0000
:3220 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3221 : 012750,052525,177777,000000
:3222 : $ 01AD,0000,0000,0000
:3223 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3224 : 000655,000000,000000,000000
:3225 : $ 11D6,0000,0000,0000
:3226 : EQUIVALENT OCTAL DATA = 10726,000000
:3227 : $ 1015,0000,0000,0000
:3228 : OCTAL DATA = 10025,000000
:3229 : $ 1013,0000,0000,0000
:3230 : OCTAL DATA = 10023,000000
:3231 : $ 1007,0000,0000,0000
:3232 : OCTAL DATA = 10007,000000
:3233 : $ 1430,0000,0000,0000
:3234 : OCTAL DATA = 12060,000000
:3235 : $ 0D30,0000,0000,0000
:3236 : OCTAL DATA = 6460,000000
:3237 :
:3238 : SUBTEST 2
:3239 : $ 1A30,5555,FFFF,0000
:3240 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3241 : 015060,052525,177777,000000
:3242 :
:3243 :
:3244 : THE FOLLOWING IS THE EXPECTED D MUX DATA FOR THE ABOVE TEST:
:3245 : % 340
:3246 : LOOP COUNT EQUALS C THRU 1, EACH PASS THRU LOOP USES ONE LONG WORD
:3247 : $ 5555,0000
:3248 : $ AAAA,FFFF
:3249 : $ 5555,0000
:3250 :
:3251 : $ 5555,0000
:3252 : $ FF2E,FFFF
    
```

```

;3253      ;$ 002E,0000
;3254
;3255      ;$ AAAA,FFFF
;3256      ;$ 5555,0000
;3257      ;$ FF5A,FFFF
;3258      ;$ FFAC,FFFF
;3259      ;$ 002A,0000
;3260      ;$ 0026,0000
;3261      ;$ 000E,0000
;3262      ;$ 0060,0000
;3263      ;$ 0060,0000
;3264      ;
;3265      ; SUBTEST 2
;3266      ;$ 5555,0000
;3267
;3268
;3269

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:3270
:3271
:3272
:3273
:3274
:3275
:3276
:3277
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:3300
:3301
:3302
:3303
:3304
:3305
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:3314
:3315
:3316
:3317
:3318
:3319
:3320
:3321
:3322
:3323
:3324
U 1114, 0000,003D,0180,0800,0000,118E
U 1115, 0018,0038,0D80,09F8,0000,1357
U 1357, 0818,0038,7980,0800,0000,1116
U 1116, 0819,0031,F580,0800,0000,11A7
U 1117, 0001,003C,0180,0A88,0000,1118
U 1118, 0818,0039,0180,0800,0000,1185
U 1119, 0001,003C,0180,09F0,0000,1358

```

```

PAGE 'TEST 12E IBA BIT<1:0> CONTROL'
*****
++
TEST 12E IBA BIT<1:0> CONTROL

TEST DESCRIPTION
THIS TEST CHECKS THAT THE BYTE ROTATOR IS SELECTED CORRECTLY
AFTER SOME BYTES HAVE BEEN SHIFTED OUT OF THE BUFFER. THIS IS DONE
BY FILLING THE BUFFER WITH THE SPECIFIED VALUE OF IBA BITS <1:0>,
EXECUTING THE SPECIFIED SHIFT, ALLOWING ONE MORE LONG WORD
TO BE READ INTO THE BUFFER, THROWING AWAY BYTES 0 THRU 6, AND CHECKING
THAT THE BYTE ROTATOR PLACED THE CORRECT DATA IN BYTE 7.
THE DATA PATTERN CONSISTS OF 8 BYTES OF ZERO FOLLOWED BY THE FOLLOWING
BYTES: 01, 02, 03, 04, 05, 06, AND 07. THE CORRECT DATA IN
BYTE 7 IS TESTED BY CHECKING THE MICRO PC BITS <7:0> WHICH SHOULD
REFLECT THE A FORK ADDRESS OF ONE OF THE ABOVE 7 BYTES.

SUBTST 1 - CHECK THAT A SHIFT OF ONE INCREMENTS THE CURRENT VALUE
OF IBA BITS<1:0> BY ONE.
SUBTST 2 - CHECK THAT A SHIFT OF TWO INCREMENTS THE CURRENT VALUE
OF IBA BITS <1:0> BY TWO.
SUBTST 3 - CHECK THAT A SHIFT OF FOUR INCREMENTS THE CURRENT VALUE
OF IBA BITS <1:0> BY FOUR, (IBA BITS <1:0> SHOULD REMAIN
THE SAME).

LOGIC DESCRIPTION
THIS TEST CHECKS THE LOGIC THAT GENERATES THE "IBA0" AND "IBA1"
SIGNALS ON THE IDP MODULE.

ERROR DESCRIPTION
DATA: EXPECTED MICRO PC BITS <7:0>
RECEIVED MICRO PC BITS <7:0>
LOOP COUNT -- INDICATES THE INITIAL VALUE OF IBA BITS <1:0>,
I.E. 4=00, 3=01, 2=10, AND 1=11.
FROM THE RECEIVED MICRO PC BITS, ONE CAN TELL HOW THE BYTE ROTATOR
FAILED. FOR EXAMPLE, IF THE EXPECTED DATA WAS 8E AND THE RECEIVED
DATA WAS 8D, IT WOULD MEAN THAT THE BYTE ROTATOR ROTATED THE DATA
ONE TOO MANY BYTES. IN OTHER WORDS BYTE 7 WAS LOADED WITH 02 INSTEAD
OF 01.

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC03--IBA BITS <1:0> ARE INCREMENTED
SUBTST 2 - SYNC04--IBA BITS <1:0> ARE INCREMENTED
SUBTST 3 - SYNC05--IBA BITS <1:0> ARE INCREMENTED
--
*****
=0
T12E: NEWTST
RC[0F] K[.3]
D_K[.30]
=0 D_D.OR.K[.A],CALL,J/DCO
RC[1] D
=0 D_K[.8],CALL,J/DCE
RC[0E]_D
: GENERATE ADR OF IB DATA
: EQUALS 3A0(X)
: SAVE
: GENERATE ADR OF A FORK DECODE
: OF OPCODE 01

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U 1358, 0001,003C,0180,0A80,0000,111A :3325
:3326
:3327
:3328
:3329
:3330
:3331
:3332
U 111A, 0000,003D,0180,0800,0000,11BC :3333
U 111B, 0018,0038,1180,09E0,0000,111C :3334
U 111C, 0000,003D,0180,0800,0000,11A2 :3335
U 111D, 0000,003C,0180,0800,0000,111E :3336
U 111E, 2000,003D,0180,0A08,4200,11D7 :3337
U 111F, C000,003C,0180,0800,0000,1120 :3338
U 1120, 0000,003D,0180,0800,0000,11DF :3339
:3340
U 1121, 0810,0038,0180,0970,0000,1122 :3341
U 1122, 0000,003D,0180,0800,0000,11D1 :3342
U 1123, 001D,A000,0180,0800,0010,1359 :3343
U 1359, 0000,013C,0180,0800,0000,1124 :3344
U 1124, 0001,A03D,0180,09E8,0000,11A5 :3345
:3346
:3347
:3348
:3349
:3350
U 1125, 0000,003C,0180,0A08,0000,135A :3351
U 135A, 0018,0014,0580,0A88,0000,135B :3352
U 135B, 0810,0038,0180,0970,0000,135C :3353
U 135C, 0019,0000,0580,09F0,0000,135D :3354
U 135D, 0810,0038,0180,0960,0000,135E :3355
U 135E, 0019,8000,0580,09E0,0010,135F :3356
U 135F, 0000,013C,0180,0800,0000,1126 :3357
U 1126, 0000,003C,0180,0800,0000,111D :3358
:3359
:3360
:3361
:3362
:3363
:3364
U 1127, 0800,003C,0180,0A00,0000,1360 :3365
U 1360, 0019,0000,0580,09F0,0000,1128 :3366
U 1128, 0000,003D,0180,0800,0000,11BC :3367
U 1129, 0018,0038,1180,09E0,0000,1361 :3368
U 1361, 0818,0038,7980,0800,0000,112A :3369
U 112A, 0819,0031,F580,0800,0000,11A7 :3370
U 112B, 0001,003C,0180,0A88,0000,112C :3371
U 112C, 0000,003D,0180,0800,0000,11A2 :3372
U 112D, 0000,003C,0180,0800,0000,112E :3373
U 112E, 2000,003D,0180,0A08,4200,11D7 :3374
U 112F, 4000,003C,0180,0800,0000,1130 :3375
U 1130, 0000,003D,0180,0800,0000,11DF :3376
U 1131, 0810,0038,0180,0970,0000,1132 :3377
U 1132, 0000,003D,0180,0800,0000,11D1 :3378
U 1133, 001D,A000,0180,0800,0010,1362 :3379

```

```

RC0]_D ; SAVE
:////////////////////
: +
: CHECK A SHIFT OF ONE BYTE
: -
=0
T12ES1: SUBTEST ; SET THE LOOP COUNT
RC[OC]_K[.4]
=0 ERLOOP
T12EL1: NOP
=0 ALU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
SYNC03: IBC7CLR.0 ; EXECUTE THE SHIFT
=0 CALL,J/GETBYTE7 ; READ ANOTHER WORD AND SHIFT OVER
; TO BYTE 7
=0 D RC[OE]
CALL,J/DISPAT ; EXECUTE BYTE 0
ALU_Q-D,CLK.UBCC,BYTE ; CHECK
Z?
=0 ERROR2,RC[OD]_Q,BYTE ; IBA BITS <1:0> FAILED
: +
: THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
: -
LAB RC[1]
RC[1]_LA+K[.1] ; INCREMENT INITIAL VALUE OF IBA
D RC[OE]
RC[OE]_D-K[.1] ; SELECT NEXT EXPECTED ADDRESS
D RC[OC]
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
Z?
=0 J/T12EL1 ; CONTINUE
:////////////////////
: +
: CHECK A SHIFT OF TWO BYTES
: -
T12ES2: D RC[0] ; GET ADDRESS OF OPCODE 01
RC[OE]_D-K[.1] ; SET INIT ADR TO THAT OF OPCODE 02
=0 SUBTEST
RC[OC]_K[.4] ; SET THE LOOP COUNT
D K[.30] ; SET ADDRESS OF IB DATA
=0 D-D,OR.K[.A],CALL,J/DCO ; EQUALS 370(16)
RC[1]_D
=0 ERLOOP
T12EL2: NOP
=0 ALU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
SYNC04: IBC7CLR.0.1 ; EXECUTE THE SHIFT
=0 CALL,J/GETBYTE7 ; READ ANOTHER WORD AND GET BYTE 7
D RC[OE]
=0 CALL,J/DISPAT ; EXECUTE BYTE 7
ALU_Q-D,CLK.UBCC,BYTE ; CHECK

```



```

U 1362, 0000,013C,0180,0800,0000,1134 :3380
U 1134, 0001,A03D,0180,09E8,0000,11A5 :3381
:3382
:3383
:3384
:3385
:3386
U 1135, 0000,003C,0180,0A08,0000,1363 :3387
U 1363, 0018,0014,0580,0A88,0000,1364 :3388
U 1364, 0810,0038,0180,0970,0000,1365 :3389
U 1365, 0019,0000,0580,09F0,0000,1366 :3390
U 1366, 0810,0038,0180,0960,0000,1367 :3391
U 1367, 0019,8000,0580,09E0,0010,1368 :3392
U 1368, 0000,013C,0180,0800,0000,1136 :3393
U 1136, 0000,003C,0180,0800,0000,112D :3394
:3395
:3396
:3397
:3398
:3399
:3400
U 1137, 0800,003C,0180,0A00,0000,1369 :3401
U 1369, 0019,0000,0D80,09F0,0000,136A :3402
U 136A, 0818,0038,7980,0800,0000,1138 :3403
U 1138, 0819,0031,F580,0800,0000,11A7 :3404
U 1139, 0001,003C,0180,0A88,0000,113A :3405
U 113A, 0000,003D,0180,0800,0000,11BC :3406
U 113B, 0018,0038,1180,09E0,0000,113C :3407
U 113C, 0000,003D,0180,0800,0000,11A2 :3408
U 113D, 0000,003C,0180,0800,0000,113E :3409
U 113E, 2000,003D,0180,0A08,4200,11D7 :3410
U 113F, E000,003C,0180,0800,0000,1140 :3411
U 1140, 0000,003D,0180,0800,0000,11DF :3412
U 1141, 0810,0038,0180,0970,0000,1142 :3413
U 1142, 0000,003D,0180,0800,0000,11D1 :3414
U 1143, 001D,A000,0180,0800,0010,136B :3415
U 136B, 0000,013C,0180,0800,0000,1144 :3416
U 1144, 0001,A03D,0180,09E8,0000,11A5 :3417
:3418
:3419
:3420
:3421
:3422
U 1145, 0000,003C,0180,0A08,0000,136C :3423
U 136C, 0018,0014,0580,0A88,0000,136D :3424
U 136D, 0810,0038,0180,0970,0000,136E :3425
U 136E, 0019,0000,0580,09F0,0000,136F :3426
U 136F, 0810,0038,0180,0960,0000,1370 :3427
U 1370, 0019,8000,0580,09E0,0010,1371 :3428
U 1371, 0000,013C,0180,0800,0000,1146 :3429
U 1146, 0000,003C,0180,0800,0000,113D :3430
U 1147, 0000,003C,0180,0800,0000,114B :3431
:3432
:3433
:3434

```

```

Z?
=0 ERROR2,RC[0D],Q,BYTE ; IBA BITS <1:0> FAILED

;+
; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
;-

LAB R[1]
R[1] LA+K[.1] ; INCREMENT INIT VALUE OF IBA
D RC[0E]
RC[0E] D-K[.1] ; SET NEXT VALUE OF EXP ADDRESS
D RC[0C]
RC[0C] D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z?
=0 J/T12EL2 ; CONTINUE

////////////////////////////////////
;+
; CHECK A SHIFT OF FOUR
;-

T12ES3: D RC[0] ; GET ADDRESS OF OPCODE 01
RC[0E] D-K[.3] ; GENERATE ADR OF OPCODE 04
D K[.30] ; SET ADR OF IB DATA
=0 D-D,OR,K[.A],CALL,J/DCO ; ...
=0 R[1] D
SUBTEST
RC[0C] K[.4] ; SET THE LOOP COUNT
=0 ERLOOP
T12EL3: NOP
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
SYNCO5: IBC7CLR.0-3 ; EXECUTE THE SHIFT
=0 CALL,J/GETBYTE7 ; READ ANOTHER WORD AND GET BYTE 7
D RC[0E]
=0 CALL,J/DISPAT ; EXECUTE BYTE 7
ALU Q-D,CLK.UBCC,BYTE ; CHECK
Z?
=0 ERROR2,RC[0D],Q,BYTE ; IBA BITS <1:0> FAILED

;+
; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
;-

LAB R[1]
R[1] LA+K[.1] ; INCREMENT INIT VALUE OF IBA
D RC[0E]
RC[0E] D-K[.1] ; SET NEXT EXPECTED ADDRESS
D RC[0C]
RC[0C] D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z?
=0 J/T12EL3 ; CONTINUE
NOP

; FOLLOWING IS THE IB DATA USED IN THE ABOVE TEST:

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```
:3435 :X 3A0
:3436 :$ 0000,0000,0000,0000,0201,0403,0605,0807
:3437
:3438
:3439
:3440 : THE FOLLOWING IS THE IB DATA FOR THE FIRST PART DONE TEST:
:3441 :X 3C0
:3442 : SUBTST 1 AND 2
:3443 :$ 6020,0060
:3444
:3445 : SUBTST 3 AND 4
:3446 :$ 4407,0000
:3447 : EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3448 : 042007,000000
:3449
:3450 : THE FOLLOWING DATA IS THE IB DATA FOR TEST 12D, SUBTEST 3.
:3451 : LOOP COUNT = 4
:3452 :X 410
:3453 :$ 8A17,AAAA,0000,0000
:3454 : OCTAL EQUIVALENT OF ABOVE OP CODE
:3455 : 105027,125252,000000,000000
:3456
:3457 : LOOP COUNT = 3
:3458 :$ 0057,AAAA,0000,0000
:3459 : OCTAL EQUIVALENT OF ABOVE OP CODE
:3460 : 000127,125252,000000,000000
:3461
:3462 : LOOP COUNT = 2
:3463 :$ 0917,AAAA,0000,0000
:3464 : OCTAL EQUIVALENT OF ABOVE OP CODE
:3465 : 004427,125252,000000,000000
:3466
:3467 : LOOP COUNT = 1
:3468 :$ 00D7,AAAA,0000,0000
:3469 : OCTAL EQUIVALENT OF ABOVE OP CODE
:3470 : 000327,125252,000000,000000
:3471
:3472 : THE FOLLOWING IS THE EXPECTED D MUX DATA FOR TEST 12D, SUBTEST 3
:3473
:3474 :X 430
:3475 : LOOP COUNT = 4,3,2, AND 1
:3476 :$ AAAA,FFFF
:3477
:3478
:3479
:3480
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:3531
:3532
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U 1148, 0000,003D,0180,0800,0000,118E
U 1149, 0000,003C,0180,0800,0000,1010
U 1010, 0000,003D,0180,0800,0000,11C9
U 1011, 0000,003C,0180,0800,0000,1372
U 1012, 0000,003C,0180,0800,0000,138D
U 1372, 0018,0038,0D80,09F8,0000,114A
U 114A, 0818,0039,3580,0800,0000,11A7
U 114B, 0001,003C,0180,0A88,0000,1373
U 1373, 0019,0030,0180,0A90,0000,114C
U 114C, 0818,0039,6580,0800,0000,11A7
U 114D, 0001,003C,0180,09E0,0084,7374
U 1374, 0818,0038,35F8,0800,0000,1375
U 1375, 0819,0030,4180,0800,0000,1376
U 1376, 0D00,003C,0180,0800,0000,1377
U 1377, 0000,003C,7580,3C00,0000,1378
U 1378, 0000,003C,0180,0A10,0200,1379
U 1379, 0000,803C,0180,C800,0000,137A
U 137A, 0001,003C,0180,0980,0000,137B
U 137B, 0000,003C,0180,0A08,0200,137C
U 137C, 0810,0038,0180,0960,0000,137D
U 137D, 0819,0000,0580,0800,0000,137E
U 137E, 0000,003C,0180,9800,0000,137F
U 137F, 0000,003C,0180,0803,0000,1380
U 1380, 0000,003C,0180,9800,0000,114E
U 114E, 0000,003D,0180,0800,0000,11A2
U 114F, 0810,0038,0180,0900,0000,1381
U 1381, 0019,0034,5D80,09F0,0000,1150
U 1150, 2000,003D,0180,0A08,4200,11D7
U 1151, 0810,0038,0180,0970,0000,1152

```

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PAGE 'TEST 12F M8224 IRD ROM BRANCH TEST'
*****
++
TEST 12F M8224 IRD ROM BRANCH TEST

TEST DESCRIPTION
THIS TEST RUNS A COUNT PATTERN THRU BYTE 0 OF THE INSTRUCTION BUFFER
AND CHECKS ALL VALUES OF THE IRD AND REI BRANCH. THIS IS DONE BY
WRITING THE COUNT PATTERN TO CACHE LOCATION 0 (WITH A 'VALIDATE'
COMMAND), THEN ALLOWING THE IB TO FETCH LOCATION 500.
THE EXPECTED BRANCH CONDITION IS STORED IN BYTES STARTING AT
CACHE LOCATION 508. THE LOW NIBBLE IS THE EXPECTED 'IRD' BRANCH AND
THE UPPER NIBBLE IS THE EXPECTED 'REI' BRANCH (BIT 0).

ERROR DESCRIPTION
DATA: EXPECTED BRANCH
RECEIVED BRANCH
LOOP COUNT - THE LOOP COUNT MINUS ONE IS THE INSTRUCTION
OP-CODE UNDER TEST.
--
*****
=0
T12F: NEWTST
NOP
=00 CALL[CHECK_TWINKLE] ; IS THIS A TWINKLE MACHINE?
J/T12F_EXEC ; BRANCH IF YES
J/T12F_EXIT ; NO

=
T12F_EXEC:
=0 R[0F],K[.3] ; 500(X)
D_K[.50],CALL[DC0] ; SAVE ADDRESS OF IB DATA
R[1],D ; GET ADDRESS OF EXPECTED DATA=508(X)
=0 R[2],D.OR.K[.8] ; GENERATE LOOP COUNT
D_K[.10],CALL[DC0] ;
R[0C],D.SC.K[.8] ;
D_K[.50],Q 0 ; GET DATA TO FORCE REPLACE GROUP
D_D.OR.K[.80] ;
D_DAL.SC ; ZERO AND DISABLE SBI IN THE CACHE
ID[MAINT],D ; AND FORCE MISS GROUP 1

T12F_L1:
VA R[2] ; LOAD ADDRESS OF EXPECTED DATA
D[BYTE],CACHE.P ; GET EXPECTED DATA
R[0],D ; SAVE
VA R[1] ; LOAD ADDRESS OF IB DATA
D_R[0C] ; GET DATA
D_D-K[.1] ; ...
MCT/VALIDATE
VA VA+4
MCT/VALIDATE
=0 ERLOOP
D_R[0] ; GET EXPECTED RESULT
R[0E],D.AND.K[.7] ; SAVE FOR TYPEOUT
=0 ALU R[1],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
D_R[0E]

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U 1152, 0018,0039,01C0,0800,0000,138C :3536 =0 Q_K[.8],CALL[BR13] ; SEE WHICH BRANCH IS ACTIVE
U 1153, 001D,2000,0180,0800,0010,1382 :3537 A[U_Q-D,CLK_UBCC ; EXPECTED BRANCH?
U 1382, 0001,213C,0180,09E8,0000,1156 :3538 Z?,RC[OD]_Q
U 1156, 0000,003D,0180,0800,0000,11A5 :3539 =0 ERROR2 ; INCORRECT BRANCH
:3540
:3541 ; NOW CHECK BIT 0 OF THE ROM WITH THE REI BRANCH
:3542
:3543 D_RC[0] ; GET EXPECTED RESULT
U 1157, 0810,0038,0180,0900,0000,1383 :3543
U 1383, 0200,003C,0180,0800,0000,1384 :3544 D_D.RIGHT2
U 1384, 0200,003C,0180,0800,0000,1385 :3545 D_D.RIGHT2
U 1385, 0819,0034,0580,09F0,0000,1158 :3546 RC[OE]_ALU,D_D.AND.K[.1] ; SAVE FOR TYPEOUT
U 1158, 0000,003D,0180,0800,0000,138B :3547 =0 CALL[BROA] ; EXECUTE THE BRANCH
U 1159, 001D,2000,0180,0800,0010,1386 :3548 ALU_Q-D,CLK_UBCC
U 1386, 0001,213C,0180,09E8,0000,115A :3549 Z?,RC[OD]_Q
U 115A, 0000,003D,0180,0800,0000,11A5 :3550 =0 ERROR2
U 115B, 0800,003C,0180,0A10,0000,1387 :3551 D_RC[2] ; GET EXPECTED DATA ADDRESS
U 1387, 0019,0014,0580,0A90,0000,1388 :3552 R[2]_ALU,ALU_D+K[.1] ; INCREMENT IT
U 1388, 0810,0038,0180,0960,0000,1389 :3553 D_RC[OC] ; GET THE LOOP COUNT
U 1389, 0819,0000,0580,09E0,0010,138A :3554 D-D-K[.1],RC[OC]_ALU,CLK_UBCC ; DECREMENT
U 138A, 0000,013C,0180,0800,0000,115C :3555 Z? ; DONE YET?
U 115C, 0000,003C,0180,0800,0000,1378 :3556 =0 J/T12F_L1 ; BRANCH IF NO
U 115D, 0000,003C,0180,0800,0000,138D :3557 J/T12F_EXIT
:3558
U 138B, 0000,0A3C,0180,0800,0000,115E :3559 BROA: BEN/REI
U 115E, 0018,003A,05C0,0800,0000,0001 :3560 =0 Q_K[.1],RETURN1
U 115F, 0000,003E,01F8,0800,0000,0001 :3561 Q_0,RETURN1
:3562
U 138C, 0000,043C,0180,0800,0000,1018 :3563 BR13: BEN/IRD
U 1018, 0019,2000,05C0,0800,0000,1019 :3564 =1000 Q_Q-K[.1]
U 1019, 0019,2000,05C0,0800,0000,101A :3565 Q_Q-K[.1]
U 101A, 0019,2000,05C0,0800,0000,101B :3566 Q_Q-K[.1]
U 101B, 0019,2000,05C0,0800,0000,101C :3567 Q_Q-K[.1]
U 101C, 0019,2000,05C0,0800,0000,101D :3568 Q_Q-K[.1]
U 101D, 0019,2000,05C0,0800,0000,101E :3569 Q_Q-K[.1]
U 101E, 0019,2000,05C0,0800,0000,101F :3570 Q_Q-K[.1]
U 101F, 0019,2002,05C0,0800,0000,0001 :3571 Q_Q-K[.1],RETURN1
:3572
U 138D, 0000,003C,0180,0800,0000,1160 :3573 T12F_EXIT:
:3574 NOP
:3575
:3576 ;X 508
:3577 ; LOOP COUNT 100 THRU F1
:3578 ; $ 0000,0010,0000,0000,0707,0000,0000,0000
:3579 ; LOOP COUNT F0 - E1
:3580 ; $ 0000,0000,0000,0000,0000,0000,0000,0000
:3581 ; LOOP COUNT E0 - D1
:3582 ; $ 0000,0000,0000,0000,0000,0000,0000,0000
:3583 ; LOOP COUNT D0 - C1
:3584 ; $ 0000,0000,0000,0000,0000,0000,0000,0000
:3585 ; LOOP COUNT C0 - B1
:3586 ; $ 0000,0000,0000,0000,0000,0000,0000,0000
:3587 ; LOOP COUNT B0 - A1
:3588 ; $ 0000,0000,0000,0000,0000,0000,0000,0000
:3589 ; LOOP COUNT A0 - 91
:3590 ; $ 0000,0000,0000,0606,0000,0000,0000,0000

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:3591 : LOOP COUNT 90 - 81
:3592 : $ 0000,0000,0000,0000,0000,0000,0000,0000
:3593 : LOOP COUNT 80 - 71
:3594 : $ 0101,0104,0000,0000,0100,0303,0101,0101
:3595 : LOOP COUNT 70 - 61
:3596 : $ 0201,0202,0101,0101,0101,0101,0101,0101
:3597 : LOOP COUNT 60 - 51
:3598 : $ 0000,0000,0000,0000,0100,0303,0101,0101
:3599 : LOOP COUNT 50 - 41
:3600 : $ 0201,0202,0101,0101,0101,0101,0101,0101
:3601 : LOOP COUNT 40 - 31
:3602 : $ 0000,0000,0000,0000,0000,0000,0607,0000
:3603 : LOOP COUNT 30 - 21
:3604 : $ 0000,0000,0000,0000,0000,0000,0000,0000
:3605 : LOOP COUNT 20 - 11
:3606 : $ 0000,0000,0000,0000,0000,0000,0000,0000
:3607 : LOOP COUNT 10 - 1
:3608 : $ 0000,0000,0000,0000,0000,0000,0000,0000
:3609
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:3610 .PAGE 'TEST 130 M8224 IRD EXECUTION POINT COUNTER TEST'
:3611 *****
:3612 ++
:3613
:3614 TEST 130 M8224 IRD EXECUTION POINT COUNTER TEST
:3615
:3616 FUNCTIONAL DESCRIPTION:
:3617
:3618 THIS TEST CHECKS THAT THE EXECUTION POINT COUNTER ADVANCES CORRECTLY
:3619 WHEN AN ESCAPE OP CODE IS BEING DECODED.
:3620
:3621 ERROR DESCRIPTION:
:3622 DATA: EXPECTED MICRO PC
:3623 RECEIVED MICRO PC
:3624
:3625 --
:3626 *****
:3627 =0
:3628 T130: NEWTST
:3629 NOP
:3630 =00 CALL[CHECK_TWINKLE] ; IS THIS A TWINKLE MACHINE?
:3631 J/T130_EXEC ; YES
:3632 J/T130_EXIT ; NO
:3633
:3634 =
:3635 T130_EXEC:
:3636 =0 RC[0F] K[.2]
:3637 D K[.4],CALL[DCB] ; GENERATE CONSTANT 4B
:3638 RC[0E] D ; EXPECTED DATA
:3639 =0 D K[.60] ; GENERATE ADDRESS OF IB DATA
:3640 D-D.OR.K[.4],CALL[DC0] ; = 640(X)
:3641 R[1]_D
:3642
:3643 ; CHECK THAT THE EXECUTION POINT COUNTER ADVANCES TO EP1
:3644 ; BDEST * ESC(0) * BC4-1 * BC4-2
:3645
:3646 ///////////////////////////////////////////////////
:3647 =0 SUBTEST
:3648 NOP
:3649 =0 ERLOOP
:3650 NOP
:3651 =0 ALU R[1],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
:3652 IBC7CLR.0 ; LOAD THE ESC FLIP-FLOP
:3653 IBC/BDEST ; SHOULD ADVANCE EP COUNTER
:3654 =0 Q_0,CALL[DISPAT] ; EXECUTE THE CALL 3
:3655 D-RC[0E] ; GET EXPECTED MICRO PC
:3656 A[U Q-D,CLK.UBCC ; WAS EP COUNTER AT 1?
:3657 Z?,RC[0D]_Q ; BRANCH IF YES
:3658 =0 ERROR2
:3659 NOP
:3660
:3661 ; NOW CHECK THAT THE EP DOESN'T INCREMENT WHEN ESC IS NOT ASCERTED
:3662 ; BDEST * -ESC(0) * BC4-1 * BC4-2
:3663
:3664 ///////////////////////////////////////////////////
:3665 =0 SUBTEST

```

U 1160, 0000,003D,0180,0800,0000,118E
U 1161, 0000,003C,0180,0800,0000,1014
U 1014, 0000,003D,0180,0800,0000,11C9
U 1015, 0000,003C,0180,0800,0000,138E
U 1016, 0000,003C,0180,0800,0000,118D

U 138E, 0018,003B,0980,09F8,0000,1162
U 1162, 0818,0039,1180,0800,0000,11B2
U 1163, 0001,003C,0180,09F0,0000,138F
U 138F, 0818,0038,A580,0800,0000,1164
U 1164, 0819,0031,1180,0800,0000,11A7
U 1165, 0001,003C,0180,0A88,0000,1166

U 1166, 0000,003D,0180,0800,0000,118C
U 1167, 0000,003C,0180,0800,0000,1168
U 1168, 0000,003D,0180,0800,0000,11A2
U 1169, 0000,003C,0180,0800,0000,116A
U 116A, 2000,003D,0180,0A08,4200,11D7
U 116B, C000,003C,0180,0800,0000,1390
U 1390, 7000,003C,0180,0800,0000,116C
U 116C, 0000,003D,01F8,0800,0000,11D1
U 116D, 0810,0038,0180,0970,0000,1391
U 1391, 001D,2000,0180,0800,0010,1392
U 1392, 0001,213C,0180,09E8,0000,116E
U 116E, 0000,003D,0180,0800,0000,11A5
U 116F, 0000,003C,0180,0800,0000,1170

U 1170, 0000,003D,0180,0800,0000,118C

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U 1171, 0800,003C,0180,0A08,0000,1393 :3665      D R[1]                : GET ADDRESS OF IB DATA
U 1393, 0019,0014,0180,0A88,0000,1394 :3666      R[1],D+K[.8]      : INCREMENT
U 1394, 0818,0038,1180,0800,0000,1395 :3667      D K[.4]
U 1395, 0001,003C,0180,09F0,0000,1172 :3668      RC[OE],D        : SET EXPECTED DATA
U 1172, 0000,003D,0180,0800,0000,11A2 :3669      ERLOOP-
U 1173, 0000,003C,0180,0800,0000,1174 :3670      NOP
U 1174, 2000,003D,0180,0A08,4200,11D7 :3671      ALU R[1],FLUSH.IB,CALL[IBWAIT] : LOAD THE IB
U 1175, C000,003C,0180,0800,0000,1396 :3672      IBC7CLR.0        : TRY AND CLOCK THE ESC LATCH
U 1396, 7000,003C,0180,0800,0000,1176 :3673      IBC/BDEST          : TRY AND ADVANCE IB COUNTER
U 1176, 0000,003D,0180,0800,0000,11D1 :3674      CALL[DISPAT]      : CHECK THAT STILL AT EPO
U 1177, 0810,0038,0180,0970,0000,1397 :3675      D RC[OE]
U 1397, 001D,2000,0180,0800,0010,1398 :3676      ACU Q-D,CLK.UBCC   : CHECK RECEIVED MICRO PC
U 1398, 0001,213C,0180,09E8,0000,1178 :3677      Z?,RC[OD],Q        : BRANCH IF OK
U 1178, 0000,003D,0180,0800,0000,11A5 :3678      ERROR2
U 1179, 0000,003C,0180,0800,0000,117A :3679      NOP
:3680
:3681
:3682      : CHECK THAT EP DOES NOT ADVANCE IF IRD ROM BIT BC4-2 IS NOT ACTIVE
:3683      BDEST * ESC(0) * BC4-1 * -BC4-2
:3684
:3685      :////////////////////
U 117A, 0000,003D,0180,0800,0000,11BC :3686      =0      SUBTEST
U 117B, 0800,003C,0180,0A08,0000,1399 :3687      D R[1]                : GET ADDRESS OF IB DATA
U 1399, 0019,0014,0180,0A88,0000,139A :3688      R[1],D+K[.8]      : INCREMENT
U 139A, 0818,0038,0580,0800,0000,139B :3689      D K[.6]
U 139B, 0001,003C,0180,09F0,0000,117C :3690      RC[OE],D        : SET EXPECTED DATA
U 117C, 0000,003D,0180,0800,0000,11A2 :3691      ERLOOP-
U 117D, 0000,003C,0180,0800,0000,117E :3692      NOP
U 117E, 2000,003D,0180,0A08,4200,11D7 :3693      ALU R[1],FLUSH.IB,CALL[IBWAIT] : LOAD THE IB
U 117F, C000,003C,0180,0800,0000,139C :3694      IBC7CLR.0        : SET THE ESC LATCH
U 139C, 7000,003C,0180,0800,0000,1180 :3695      IBC/BDEST          : TRY AND ADVANCE IB COUNTER
U 1180, 0000,003D,0180,0800,0000,11D1 :3696      CALL[DISPAT]      : CHECK THAT STILL AT EPO
U 1181, 0810,0038,0180,0970,0000,139D :3697      D RC[OE]
U 139D, 001D,2000,0180,0800,0010,139E :3698      ACU Q-D,CLK.UBCC   : CHECK RECEIVED MICRO PC
U 139E, 0001,213C,0180,09E8,0000,1182 :3699      Z?,RC[OD],Q        : BRANCH IF OK
U 1182, 0000,003D,0180,0800,0000,11A5 :3700      ERROR2
U 1183, 0000,003C,0180,0800,0000,1184 :3701      NOP
:3702
:3703      : CHECK THAT EP COUNTER DOES NOT ADVANCE IF BDEST IS NOT ACTIVE
:3704      -BDEST * ESC(0) * BC4-1 * BC4-2
:3705
:3706      :////////////////////
U 1184, 0000,003D,0180,0800,0000,11BC :3707      =0      SUBTEST
U 1185, 0800,003C,0180,0A08,0000,139F :3708      D R[1]                : GET ADDRESS OF IB DATA
U 139F, 0019,0014,0180,0A88,0000,13A0 :3709      R[1],D+K[.8]      : INCREMENT
U 13A0, 0818,0038,1180,0800,0000,13A1 :3710      D K[.4]
U 13A1, 0001,003C,0180,09F0,0000,1186 :3711      RC[OE],D        : SET EXPECTED DATA
U 1186, 0000,003D,0180,0800,0000,11A2 :3712      ERLOOP-
U 1187, 0000,003C,0180,0800,0000,1188 :3713      NOP
U 1188, 2000,003D,0180,0A08,4200,11D7 :3714      ALU R[1],FLUSH.IB,CALL[IBWAIT] : LOAD THE IB
U 1189, C000,003C,0180,0800,0000,13A2 :3715      IBC7CLR.0        : LOAD THE ESC LATCH
U 13A2, 0000,003C,0180,0800,0000,118A :3716      NOP              : DON'T ASCERT BDEST
U 118A, 0000,003D,0180,0800,0000,11D1 :3717      CALL[DISPAT]      : CHECK THAT STILL AT EPO
U 118B, 0810,0038,0180,0970,0000,13A3 :3718      D RC[OE]
U 13A3, 001D,2000,0180,0800,0010,13A4 :3719      ACU Q-D,CLK.UBCC   : CHECK RECEIVED MICRO PC

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ZZ-ESKAH-V132 TEST 130 MB224 IRD EXECUTION POINT COUNTER TEST F 11
ESKAH36.MCR MICRO2 1M(01) 16-DEC-82 12:16:21

SEQ 0955
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U 13A4, 0001,213C,0180,09E8,0000,118C :3720      Z?,RC[OD],Q      ; BRANCH IF OK
U 118C, 0000,003D,0180,0800,0000,11A5 :3721      =0      ERROR2
:3722      T130_EXIT:
:3723      NOP
:3724
:3725      ;X 640
:3726      ; IB DATA FOR SUBTEST 1
:3727      ; $ 33FD,5050,5050,5050
:3728      ; IB DATA FOR SUBTEST 2
:3729      ; $ 3300,5050,5050,5050
:3730      ; IB DATA FOR SUBTEST 3
:3731      ; $ 75FD,5050,5050,5050
:3732      ; IB DATA FOR SUBTEST 4
:3733      ; $ 33FD,5050,5050,5050
:3734
:3735
:3736
U 13A5, 0000,003D,0180,0800,0000,118E :3737      ENDTST: NEWTST
```


ZZ-ESKAH-V132 Line Number Index

ESKAH36.MCR

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Location / Line Number Index

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1876=	1845	1847=	1866=	1867=	1868=	1846	2066=
U 1008	3112=	3113=	3117=	1869	1884=	1885=	1870	2067=
U 1010	3505=	3506=	3507=	1871	3630=	3631=	3632=	1872
U 1018	3564=	3565=	3566=	3567=	3568=	3569=	3570=	3571=
U 1020	2060=	2061=	2443=	2444=	2446=	2447=	2448=	2449=
U 1028	2457=	2458=	2459=	2460=	2461=	2462=	2463=	2464=
U 1030	2465=	2466=	2468=	2475=	2476=	2477=	2478=	2479=
U 1038	2480=	2481=	2482=	2483=	2484=	2485=	2486=	2487=
U 1040	2488=	2489=	2491=	2498=	2499=	2500=	2501=	2502=
U 1048	2503=	2504=	2505=	2506=	2510=	2511=	1920:	1873
U 1050	2512=	2513=	2518=	2519=	2521=	2528=	2530=	2531=
U 1058	2532=	2533=	1924:	1874	2534=	2535=	1928:	1875
U 1060	2536=	2537=	2538=	2539=	2544=	2545=	2547=	2548=
U 1068	2580=	2581=	2583=	2584=	2585=	2586=	2597=	2598=
U 1070	2599=	2600=	2601=	2602=	2603=	2604=	2606=	2607=
U 1078	2614=	2615=	2693=	2694=	2696=	2697=	2698=	2699=
U 1080	2700=	2701=	2715=	2716=	2717=	2718=	2722=	2723=
U 1088	2724=	2725=	2727=	2728=	2737=	2738=	2791=	2792=
U 1090	2793=	2794=	2796=	2797=	2809=	2810=	2811=	2812=
U 1098	2813=	2814=	2815=	2816=	2817=	2818=	2820=	2821=
U 10A0	2828=	2829=	2908=	2909=	2911=	2912=	2922=	2923=
U 10A8	2924=	2925=	2926=	2927=	2928=	2929=	2930=	2931=
U 10B0	2932=	2933=	2935=	2936=	2973=	2974=	2977=	2978=
U 10B8	2979=	2980=	2989=	2990=	2991=	2992=	2993=	2994=
U 10C0	2996=	2997=	2999=	3006=	3007=	3008=	3009=	3010=
U 10C8	3011=	3012=	3013=	3014=	3015=	3016=	3018=	3019=
U 10D0	3065=	3066=	3068=	3069=	3071=	3072=	3080=	3081=
U 10D8	3084=	3085=	3086=	3087=	3088=	3089=	3093=	3094=
U 10E0	3102=	3103=	3107=	3111=	3129=	3130=	3133=	3134=
U 10E8	3135=	3136=	3137=	3138=	3139=	3140=	3143=	3144=
U 10F0	3153=	3154=	3160=	3161=	3165=	3166=	3167=	3168=
U 10F8	3169=	3170=	3171=	3172=	3173=	3174=	3175=	3176=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1882	3177=	3178=	1840:	1841:	1842:	1843:
U 1110	3181=	3182=	3187=	3188=	3317=	3318=	3320=	3321=
U 1118	3322=	3324=	3333=	3334=	3335=	3336=	3337=	3338=
U 1120	3339=	3341=	3342=	3343=	3345=	3351=	3358=	3365=
U 1128	3367=	3368=	3370=	3371=	3372=	3373=	3374=	3375=
U 1130	3376=	3377=	3378=	3379=	3381=	3387=	3394=	3401=
U 1138	3404=	3405=	3406=	3407=	3408=	3409=	3410=	3411=
U 1140	3412=	3413=	3414=	3415=	3417=	3423=	3430=	3431=
U 1148	3503=	3504=	3511=	3512=	3514=	3515=	3531=	3532=
U 1150	3534=	3535=	3536=	3537=	1883	2255:	3539=	3543=
U 1158	3547=	3548=	3550=	3551=	3556=	3557=	3560=	3561=
U 1160	3628=	3629=	3636=	3637=	3639=	3640=	3646=	3647=
U 1168	3648=	3649=	3650=	3651=	3653=	3654=	3657=	3658=
U 1170	3664=	3665=	3669=	3670=	3671=	3672=	3674=	3675=
U 1178	3678=	3679=	3686=	3687=	3691=	3692=	3693=	3694=
U 1180	3696=	3697=	3700=	3701=	3707=	3708=	3712=	3713=
U 1188	3714=	3715=	3717=	3718=	3721=	3723=	1897	1898
U 1190	1899	1900	1901	1902	1903	1904	1905	1906
U 1198	1907	1908	1909	1910	1911	1912	1913	1914

ZZ-ESKAH-V132
ESKAH36.MCR

Line Number Index

MICRO2

1M(01)

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	1915	1916	1917	1918	1919	1922	1923	1966
U 11A8	1967	1968	1969	1970	1971	1972	1973	1974
U 11B0	1975	1976	1977	1978	1979	1980	1981	1983
U 11B8	1984	1985	1986	1988	1998	1999	2007	2008
U 11C0	2009	2029	2030	2031	2032	2038	2039	2040
U 11C8	2041	2056	2057	2058	2059	2062	2063	2064
U 11D0	2065	2079	2348	2349	2350	2351	2352	2363
U 11D8	2364	2365	2366	2367	2368	2369	2373	2382
U 11E0	2383	2384	2385	2386	2387	2388	2389	2390
U 11E8	2445	2467	2490	2507	2508	2509	2514	2515
U 11F0	2516	2517	2520	2529	2540	2541	2542	2543
U 11F8	2546	2582	2593	2594	2595	2596	2605	2608
U 1200	2084:	2085:	2086:	2087:	2088:	2089:	2090:	2091:
U 1208	2092:	2093:	2094:	2095:	2096:	2097:	2098:	2099:
U 1210	2100:	2101:	2102:	2103:	2104:	2105:	2106:	2107:
U 1218	2108:	2109:	2110:	2111:	2112:	2113:	2114:	2115:
U 1220	2116:	2117:	2118:	2119:	2120:	2121:	2122:	2123:
U 1228	2124:	2125:	2126:	2127:	2128:	2129:	2130:	2131:
U 1230	2132:	2133:	2134:	2135:	2136:	2137:	2138:	2139:
U 1238	2140:	2141:	2142:	2143:	2144:	2145:	2146:	2147:
U 1240	2148:	2149:	2150:	2151:	2152:	2153:	2154:	2155:
U 1248	2156:	2157:	2158:	2159:	2160:	2161:	2162:	2163:
U 1250	2164:	2165:	2166:	2167:	2168:	2169:	2170:	2171:
U 1258	2172:	2173:	2174:	2175:	2176:	2177:	2178:	2179:
U 1260	2180:	2181:	2182:	2183:	2184:	2185:	2186:	2187:
U 1268	2188:	2189:	2190:	2191:	2192:	2193:	2194:	2195:
U 1270	2196:	2197:	2198:	2199:	2200:	2201:	2202:	2203:
U 1278	2204:	2205:	2206:	2207:	2208:	2209:	2210:	2211:
U 1280	2212:	2213:	2214:	2215:	2216:	2217:	2218:	2219:
U 1288	2220:	2221:	2222:	2223:	2224:	2225:	2226:	2227:
U 1290	2228:	2229:	2230:	2231:	2232:	2233:	2234:	2235:
U 1298	2236:	2237:	2238:	2239:	2240:	2241:	2242:	2243:
U 12A0	2244:	2245:	2246:	2247:	2248:	2249:	2250:	2251:
U 12A8	2252:	2253:	2254:	2256:	2257:	2258:	2259:	2260:
U 12B0	2261:	2262:	2263:	2264:	2265:	2266:	2267:	2268:
U 12B8	2269:	2270:	2271:	2272:	2273:	2274:	2275:	2276:
U 12C0	2277:	2278:	2279:	2280:	2281:	2282:	2283:	2284:
U 12C8	2285:	2286:	2287:	2288:	2289:	2290:	2291:	2292:
U 12D0	2293:	2294:	2295:	2296:	2297:	2298:	2299:	2300:
U 12D8	2301:	2302:	2303:	2304:	2305:	2306:	2307:	2308:
U 12E0	2309:	2310:	2311:	2312:	2313:	2314:	2315:	2316:
U 12E8	2317:	2318:	2319:	2320:	2321:	2322:	2323:	2324:
U 12F0	2325:	2326:	2327:	2328:	2329:	2330:	2331:	2332:
U 12F8	2333:	2334:	2335:	2336:	2337:	2338:	2339:	2340:
U 1300	2609	2610	2611	2612	2613	2695	2708	2709
U 1308	2710	2711	2712	2713	2714	2719	2720	2721
U 1310	2726	2729	2730	2731	2732	2733	2734	2735
U 1318	2736	2795	2804	2805	2806	2807	2808	2819
U 1320	2822	2823	2824	2825	2826	2827	2910	2913
U 1328	2914	2915	2934	2975	2976	2981	2995	2998
U 1330	3017	3067	3070	3079	3082	3083	3090	3091
U 1338	3092	3095	3096	3097	3098	3100	3101	3105
U 1340	3106	3118	3119	3120	3121	3131	3132	3141

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3142	3155	3156	3157	3158	3159	3162	3163
U 1350	3164	3179	3180	3183	3184	3185	3186	3319
U 1358	3325	3344	3352	3353	3354	3355	3356	3357
U 1360	3366	3369	3380	3388	3389	3390	3391	3392
U 1368	3393	3402	3403	3416	3424	3425	3426	3427
U 1370	3428	3429	3510	3513	3516	3517	3518	3519
U 1378	3522	3523	3524	3525	3526	3527	3528	3529
U 1380	3530	3533	3538	3544	3545	3546	3549	3552
U 1388	3553	3554	3555	3559	3563	3574	3635	3638
U 1390	3652	3655	3656	3666	3667	3668	3673	3676
U 1398	3677	3688	3689	3690	3695	3698	3699	3709
U 13A0	3710	3711	3716	3719	3720	3737		
U 13A8 - 13DF	Unused							
U 13E0	2016:	2017:	2018:	2019:	2020:	2021:	2022:	2023:
U 13E8 - 13EF	Unused							
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

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	Words not in bounds
ESKOODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH36	958

Used	958
Remaining	

Total microwords used in memory U: 958
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

2 E
CCCCC
CCCCC

ZZ-ESKAH-V132 Line Number Index K 11
ESKAH36.MCR MICRO2 1M(01) 16-DEC-82 12:16:21

SEQ 0960
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; The files used in this assembly are:

ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH36.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

CCCCC

C

ESKAH37.MCR

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: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2309	TEST 131 IB REQUEST AND COUNT TEST
: 2576	TEST 132 VAX MODE SPECIFIER 1 CONSTANT
: 2639	TEST 133 COMPATABILITY MODE SP1 AND SP2 CONSTANTS
: 2780	TEST 134 PC REGISTER INCREMENT BY 'N'
: 2851	TEST 135 INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING
: 3344	TEST 136 BMUX GETS PC OR LB FUNCTION
: 3409	TEST 137 SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE
: 3475	TEST 138 COMPATABILITY MODE CONTEXT LATCH

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M 11

SEQ 0962
Page

:1
:1804 .NOLIST
:1805 .LIST

.REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
 EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

U 1100, 0000,003C,19C0,0A78,0084,7001
 U 1101, 0000,003C,05C0,0A78,0084,7001
 U 1102, 0000,003C,09C0,0A78,0084,7001
 U 1103, 0000,003C,0DC0,0A78,0084,7001
 U 1104, 0000,003C,11C0,0A78,0084,7001
 U 1105, 0000,003C,D5C0,0A78,0084,7001
 U 1106, 0000,003C,D9C0,0A78,0084,7001
 U 1107, 0000,003C,5DC0,0A78,0084,7001
 U 1108, 0000,003C,01C0,0A78,0084,7001
 U 110C, 0000,003C,85C0,0A78,0084,7001
 U 110D, 0000,003C,89C0,0A78,0084,7001
 U 110E, 0000,003C,65C0,0A78,0084,7001
 U 110F, 0000,003C,61C0,0A78,0084,7159
 U 1001, 0001,2024,0180,0800,0010,104F
 U 104F, 0000,013C,0180,0800,0000,1002
 U 1002, 0001,2036,0180,0AF8,0000,0000

1100: SC_K[ZERO],Q_R[OF],J/TRPH0 : SYSTEM INIT
 1101: SC_K[.1],Q_R[OF],J/TRPH0 : DATA UNALIGNED
 1102: SC_K[.2],Q_R[OF],J/TRPH0 : X PAGE ERROR
 1103: SC_K[.3],Q_R[OF],J/TRPH0 : TB MODIFY
 1104: SC_K[.4],Q_R[OF],J/TRPH0 : TB PROT ERROR
 1105: SC_K[.6],Q_R[OF],J/TRPH0 : TB MISS
 1106: SC_K[.9],Q_R[OF],J/TRPH0 : RES FLOAT OPER
 1107: SC_K[.7],Q_R[OF],J/TRPH0 : TB PARITY
 1108: SC_K[.8],Q_R[OF],J/TRPH0 : CACHE PARITY
 110C: SC_K[.C],Q_R[OF],J/TRPH0 : RDS
 110D: SC_K[.D],Q_R[OF],J/TRPH0 : TIME OUT
 110E: SC_K[.10],Q_R[OF],J/TRPH0 : ODD ADDRESS
 110F: SC_K[.F],Q_R[OF],J/TRPH2 : CS PARITY
 TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC : WAS TRAP EXPECTED?
 Z? : BRANCH IF NO
 =0 ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 : CLEAR THE BIT AND RETURN

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
 TRAP CODE--INDICATES WHICH TRAP OCCURRED
 FAULT STATUS REGISTER
 SBI ERROR REGISTER
 TIMEOUT ADDRESS REGISTER
 MAINTENANCE REGISTER


```

:1861
:1862
:1863
:1864
:1865
U 1003, 0018,0038,1D80,09E8,0000,1004 :1866
U 1004, 0000,003D,D980,0800,0084,718B :1867
U 1005, 0000,003C,49F0,2C00,0000,105B :1868
U 105B, 0001,203C,4DF0,2DB0,0000,105F :1869
U 105F, 0001,203C,65F0,2DB8,0000,1109 :1870
U 1109, 0001,203C,6DF0,2DD8,0000,1154 :1871
U 1154, 0001,203C,75F0,2DE0,0000,1156 :1872
U 1156, 0001,203C,79F0,2DC8,0000,1157 :1873
U 1157, 0001,203C,69F0,2DC0,0000,1158 :1874
U 1158, 0001,203C,81F0,2DD0,0000,1000 :1875
U 1000, 0001,203D,0180,09F0,0000,1170 :1876
:1877
:1878
:1879
:1880
:1881
U 1159, 0001,2024,0180,0800,0010,115A :1882
U 115A, 0000,013C,0180,0800,0000,1006 :1883
U 1006, 0001,2036,0180,0AF8,0000,0001 :1884
U 1007, 0000,0037,0180,0800,0000,1003 :1885
:1886
:1887
:1888
:1889
:1890
:1891
:1892
:1893
:1894
:1895
:1896
U 115B, 0000,003C,65F8,0800,0084,715C :1897
U 115C, 0818,0038,8D80,0800,0000,115D :1898
U 115D, 0D00,003C,0180,0800,0000,115E :1899
U 115E, 0000,003C,3D80,3C00,0000,115F :1900
U 115F, 0818,0038,0580,0800,0000,1160 :1901
U 1160, 0D00,003C,0180,0800,0000,1161 :1902
U 1161, 0F00,003C,3180,3C00,0000,1162 :1903
U 1162, 0000,003C,5D80,3C00,0000,1163 :1904
U 1163, 0000,003C,3980,3C00,0000,1164 :1905
U 1164, 0000,003C,2980,3C00,0000,1165 :1906
U 1165, 0000,003C,4980,3C00,0000,1166 :1907
U 1166, 0000,003C,7180,3C00,0000,1167 :1908
U 1167, 0818,0038,C180,0800,0000,1168 :1909
U 1168, 0000,003C,6580,3C00,0000,1169 :1910
U 1169, 0F00,003C,6D80,3C00,0000,116A :1911
U 116A, 0000,003C,6D80,3C00,0000,116B :1912
U 116B, 0000,003C,6580,3C00,0000,116C :1913
U 116C, 0003,003C,0180,09F0,0000,116D :1914
U 116D, 0003,003C,0180,0AF8,0000,116E :1915

```

```

:1861 : CACHE PARITY REGISTER
:1862 : TB ERROR REGISTER 1
:1863 : TB ERROR REGISTER 0
:1864 : -
:1865 :
TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

: +
: THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
: -
TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC : WAS THE TRAP EXPECTED?
Z? : BRANCH IF NO
=0 ALU_Q[AND]MASK,RC[0F]_ALU,RETURN1 : RETURN
J/TRPH1 : REPORT UNEXPECTED TRAP

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2
:
SCOPE: SC_K[.10],Q_0 : SETUP TO WRITE IPL OF 1F
D_R[.1F] : ...
D-DAL.SC
ID[PSL]_D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES]_D,D_0 : CLEAR THE CES REGISTER
ID[ACC.CS]_D : SHUT OFF THE FLOATING POINT
ID[SIR]_D : CLEAR THE SIR REGISTER
ID[CLK.CS]_D : STOP INTERVAL TIMER
ID[TBER0]_D : SHUT OFF THE TB
ID[COMP]_D : CLEAR SILO COMPARATOR
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0E]_0
RC[0F]_0

```

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ESKAH37.MCR

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U 116E, 0003,003C,0180,09E8,0000,105E :1916
U 116F, 0818,0038,0980,0800,0000,105E :1917
U 1170, 0810,0038,0180,0978,0000,1171 :1918
U 1171, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 1172, 0810,0038,0180,0978,0000,1173 :1922
U 1173, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
:1927
U 105E, 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,1174 :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 1174, 0018,0038,1980,0800,0000,1184 :1966
U 1175, 0018,0038,1980,0800,0000,1185 :1967
U 1176, 0018,0038,1980,0800,0000,1186 :1968
U 1177, 0018,0038,1980,0800,0000,1187 :1969
U 1178, 0018,0038,0980,0800,0000,1184 :1970

```

```

RC[0D] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]

```

```

D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON

```

```

ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON

```

```

105E:
CALLCON:
ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
: -

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

```

```

: +
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
:
: FOR EXAMPLE: IF A HEX '55' IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
: THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

```

```

=0 D 0,CALL,J/DC5
NOP
=0 CALL,J/DC5

```

```

: -
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```

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```

U 1179, 0018,0038,0980,0800,0000,1185 :1971
U 117A, 0018,0038,0980,0800,0000,1186 :1972
U 117B, 0018,0038,0980,0800,0000,1187 :1973
U 117C, 0018,0038,0580,0800,0000,1184 :1974
U 117D, 0018,0038,0580,0800,0000,1185 :1975
U 117E, 0018,0038,0580,0800,0000,1186 :1976
U 117F, 0018,0038,0580,0800,0000,1187 :1977
U 1180, 0018,0038,C180,0800,0000,1184 :1978
U 1181, 0018,0038,C180,0800,0000,1185 :1979
U 1182, 0018,0038,C180,0800,0000,1186 :1980
U 1183, 0018,0038,C180,0800,0000,1187 :1981
                                     :1982
U 1184, 0118,0038,1880,0800,0000,1188 :1983
U 1185, 0118,0038,0B80,0800,0000,1188 :1984
U 1186, 0118,0038,0780,0800,0000,1188 :1985
U 1187, 0118,0038,C380,0800,0000,1188 :1986
                                     :1987
U 1188, 0100,003E,0380,0800,0000,0001 :1988
                                     :1989
                                     :1990
                                     :1991
                                     :1992
                                     :1993
                                     :1994
                                     :1995
                                     :1996
                                     :1997
U 1189, 0810,0038,4D80,0978,0000,118A :1998
U 118A, 0019,4016,4D80,09F8,0000,0001 :1999
                                     :2000
                                     :2001
                                     :2002
                                     :2003
                                     :2004
                                     :2005
                                     :2006
U 118B, 0010,0038,01C0,0978,0000,118C :2007
U 118C, 0019,2034,4DC0,0800,0000,118D :2008
U 118D, 0019,2032,1D80,09F8,0000,0001 :2009
                                     :2010

```

```

DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_0(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT

```

```

;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-

```

```

SUBTST: D_RC[0F],KMX/.FF00
        RC[0F],D+K[.FF00],WORD,RETURN1

```

```

;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-

```

```

SETRCF: Q_RC[0F]
        Q-Q.AND.K[.FF00]
        RC[0F],Q.OR.SC,RETURN1

```

U 1155, 0019,2000,05C0,0800,0000,12AB :2011
:2012
:2013
:2014
:2015
:2016
:2017
:2018
:2019
:2020
:2021
U 118E, 0038,003B,41C0,0800,0000,1200 :2022
:2023
:2024
:2025
:2026
U 1200, 0019,2000,05C0,0800,0000,1201 :2027
U 1201, 0019,2000,05C0,0800,0000,1202 :2028
U 1202, 0019,2000,05C0,0800,0000,1203 :2029
U 1203, 0019,2000,05C0,0800,0000,1204 :2030
U 1204, 0019,2000,05C0,0800,0000,1205 :2031
U 1205, 0019,2000,05C0,0800,0000,1206 :2032
U 1206, 0019,2000,05C0,0800,0000,1207 :2033
U 1207, 0019,2000,05C0,0800,0000,1208 :2034
U 1208, 0019,2000,05C0,0800,0000,1209 :2035
U 1209, 0019,2000,05C0,0800,0000,120A :2036
U 120A, 0019,2000,05C0,0800,0000,120B :2037
U 120B, 0019,2000,05C0,0800,0000,120C :2038
U 120C, 0019,2000,05C0,0800,0000,120D :2039
U 120D, 0019,2000,05C0,0800,0000,120E :2040
U 120E, 0019,2000,05C0,0800,0000,120F :2041
U 120F, 0019,2000,05C0,0800,0000,1210 :2042
U 1210, 0019,2000,05C0,0800,0000,1211 :2043
U 1211, 0019,2000,05C0,0800,0000,1212 :2044
U 1212, 0019,2000,05C0,0800,0000,1213 :2045
U 1213, 0019,2000,05C0,0800,0000,1214 :2046
U 1214, 0019,2000,05C0,0800,0000,1215 :2047
U 1215, 0019,2000,05C0,0800,0000,1216 :2048
U 1216, 0019,2000,05C0,0800,0000,1217 :2049
U 1217, 0019,2000,05C0,0800,0000,1218 :2050
U 1218, 0019,2000,05C0,0800,0000,1219 :2051
U 1219, 0019,2000,05C0,0800,0000,121A :2052
U 121A, 0019,2000,05C0,0800,0000,121B :2053
U 121B, 0019,2000,05C0,0800,0000,121C :2054
U 121C, 0019,2000,05C0,0800,0000,121D :2055
U 121D, 0019,2000,05C0,0800,0000,121E :2056
U 121E, 0019,2000,05C0,0800,0000,121F :2057
U 121F, 0019,2000,05C0,0800,0000,1220 :2058
U 1220, 0019,2000,05C0,0800,0000,1221 :2059
U 1221, 0019,2000,05C0,0800,0000,1222 :2060
U 1222, 0019,2000,05C0,0800,0000,1223 :2061
U 1223, 0019,2000,05C0,0800,0000,1224 :2062
U 1224, 0019,2000,05C0,0800,0000,1225 :2063
U 1225, 0019,2000,05C0,0800,0000,1226 :2064
:2065

1155: Q_Q-K[.1],J/12AB

*
: THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
: THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
: AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
: THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
: THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
: THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
:-

SYNCOO:

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL

1200:

DISPATTBL:

1200: Q_Q-K[.1]
1201: Q_Q-K[.1]
1202: Q_Q-K[.1]
1203: Q_Q-K[.1]
1204: Q_Q-K[.1]
1205: Q_Q-K[.1]
1206: Q_Q-K[.1]
1207: Q_Q-K[.1]
1208: Q_Q-K[.1]
1209: Q_Q-K[.1]
120A: Q_Q-K[.1]
120B: Q_Q-K[.1]
120C: Q_Q-K[.1]
120D: Q_Q-K[.1]
120E: Q_Q-K[.1]
120F: Q_Q-K[.1]
1210: Q_Q-K[.1]
1211: Q_Q-K[.1]
1212: Q_Q-K[.1]
1213: Q_Q-K[.1]
1214: Q_Q-K[.1]
1215: Q_Q-K[.1]
1216: Q_Q-K[.1]
1217: Q_Q-K[.1]
1218: Q_Q-K[.1]
1219: Q_Q-K[.1]
121A: Q_Q-K[.1]
121B: Q_Q-K[.1]
121C: Q_Q-K[.1]
121D: Q_Q-K[.1]
121E: Q_Q-K[.1]
121F: Q_Q-K[.1]
1220: Q_Q-K[.1]
1221: Q_Q-K[.1]
1222: Q_Q-K[.1]
1223: Q_Q-K[.1]
1224: Q_Q-K[.1]
1225: Q_Q-K[.1]

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U 1226,	0019,2000,05C0,0800,0000,1227	:2066	1226:	Q-Q-K[.1]
U 1227,	0019,2000,05C0,0800,0000,1228	:2067	1227:	Q-Q-K[.1]
U 1228,	0019,2000,05C0,0800,0000,1229	:2068	1228:	Q-Q-K[.1]
U 1229,	0019,2000,05C0,0800,0000,122A	:2069	1229:	Q-Q-K[.1]
U 122A,	0019,2000,05C0,0800,0000,122B	:2070	122A:	Q-Q-K[.1]
U 122B,	0019,2000,05C0,0800,0000,122C	:2071	122B:	Q-Q-K[.1]
U 122C,	0019,2000,05C0,0800,0000,122D	:2072	122C:	Q-Q-K[.1]
U 122D,	0019,2000,05C0,0800,0000,122E	:2073	122D:	Q-Q-K[.1]
U 122E,	0019,2000,05C0,0800,0000,122F	:2074	122E:	Q-Q-K[.1]
U 122F,	0019,2000,05C0,0800,0000,1230	:2075	122F:	Q-Q-K[.1]
U 1230,	0019,2000,05C0,0800,0000,1231	:2076	1230:	Q-Q-K[.1]
U 1231,	0019,2000,05C0,0800,0000,1232	:2077	1231:	Q-Q-K[.1]
U 1232,	0019,2000,05C0,0800,0000,1233	:2078	1232:	Q-Q-K[.1]
U 1233,	0019,2000,05C0,0800,0000,1234	:2079	1233:	Q-Q-K[.1]
U 1234,	0019,2000,05C0,0800,0000,1235	:2080	1234:	Q-Q-K[.1]
U 1235,	0019,2000,05C0,0800,0000,1236	:2081	1235:	Q-Q-K[.1]
U 1236,	0019,2000,05C0,0800,0000,1237	:2082	1236:	Q-Q-K[.1]
U 1237,	0019,2000,05C0,0800,0000,1238	:2083	1237:	Q-Q-K[.1]
U 1238,	0019,2000,05C0,0800,0000,1239	:2084	1238:	Q-Q-K[.1]
U 1239,	0019,2000,05C0,0800,0000,123A	:2085	1239:	Q-Q-K[.1]
U 123A,	0019,2000,05C0,0800,0000,123B	:2086	123A:	Q-Q-K[.1]
U 123B,	0019,2000,05C0,0800,0000,123C	:2087	123B:	Q-Q-K[.1]
U 123C,	0019,2000,05C0,0800,0000,123D	:2088	123C:	Q-Q-K[.1]
U 123D,	0019,2000,05C0,0800,0000,123E	:2089	123D:	Q-Q-K[.1]
U 123E,	0019,2000,05C0,0800,0000,123F	:2090	123E:	Q-Q-K[.1]
U 123F,	0019,2000,05C0,0800,0000,1240	:2091	123F:	Q-Q-K[.1]
U 1240,	0019,2000,05C0,0800,0000,1241	:2092	1240:	Q-Q-K[.1]
U 1241,	0019,2000,05C0,0800,0000,1242	:2093	1241:	Q-Q-K[.1]
U 1242,	0019,2000,05C0,0800,0000,1243	:2094	1242:	Q-Q-K[.1]
U 1243,	0019,2000,05C0,0800,0000,1244	:2095	1243:	Q-Q-K[.1]
U 1244,	0019,2000,05C0,0800,0000,1245	:2096	1244:	Q-Q-K[.1]
U 1245,	0019,2000,05C0,0800,0000,1246	:2097	1245:	Q-Q-K[.1]
U 1246,	0019,2000,05C0,0800,0000,1247	:2098	1246:	Q-Q-K[.1]
U 1247,	0019,2000,05C0,0800,0000,1248	:2099	1247:	Q-Q-K[.1]
U 1248,	0019,2000,05C0,0800,0000,1249	:2100	1248:	Q-Q-K[.1]
U 1249,	0019,2000,05C0,0800,0000,124A	:2101	1249:	Q-Q-K[.1]
U 124A,	0019,2000,05C0,0800,0000,124B	:2102	124A:	Q-Q-K[.1]
U 124B,	0019,2000,05C0,0800,0000,124C	:2103	124B:	Q-Q-K[.1]
U 124C,	0019,2000,05C0,0800,0000,124D	:2104	124C:	Q-Q-K[.1]
U 124D,	0019,2000,05C0,0800,0000,124E	:2105	124D:	Q-Q-K[.1]
U 124E,	0019,2000,05C0,0800,0000,124F	:2106	124E:	Q-Q-K[.1]
U 124F,	0019,2000,05C0,0800,0000,1250	:2107	124F:	Q-Q-K[.1]
U 1250,	0019,2000,05C0,0800,0000,1251	:2108	1250:	Q-Q-K[.1]
U 1251,	0019,2000,05C0,0800,0000,1252	:2109	1251:	Q-Q-K[.1]
U 1252,	0019,2000,05C0,0800,0000,1253	:2110	1252:	Q-Q-K[.1]
U 1253,	0019,2000,05C0,0800,0000,1254	:2111	1253:	Q-Q-K[.1]
U 1254,	0019,2000,05C0,0800,0000,1255	:2112	1254:	Q-Q-K[.1]
U 1255,	0019,2000,05C0,0800,0000,1256	:2113	1255:	Q-Q-K[.1]
U 1256,	0019,2000,05C0,0800,0000,1257	:2114	1256:	Q-Q-K[.1]
U 1257,	0019,2000,05C0,0800,0000,1258	:2115	1257:	Q-Q-K[.1]
U 1258,	0019,2000,05C0,0800,0000,1259	:2116	1258:	Q-Q-K[.1]
U 1259,	0019,2000,05C0,0800,0000,125A	:2117	1259:	Q-Q-K[.1]
U 125A,	0019,2000,05C0,0800,0000,125B	:2118	125A:	Q-Q-K[.1]
U 125B,	0019,2000,05C0,0800,0000,125C	:2119	125B:	Q-Q-K[.1]
U 125C,	0019,2000,05C0,0800,0000,125D	:2120	125C:	Q-Q-K[.1]

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U 125D.	0019.2000.05C0.0800.0000.125E	:2121	125D:	Q-Q-K[.1]
U 125E.	0019.2000.05C0.0800.0000.125F	:2122	125E:	Q-Q-K[.1]
U 125F.	0019.2000.05C0.0800.0000.1260	:2123	125F:	Q-Q-K[.1]
U 1260.	0019.2000.05C0.0800.0000.1261	:2124	1260:	Q-Q-K[.1]
U 1261.	0019.2000.05C0.0800.0000.1262	:2125	1261:	Q-Q-K[.1]
U 1262.	0019.2000.05C0.0800.0000.1263	:2126	1262:	Q-Q-K[.1]
U 1263.	0019.2000.05C0.0800.0000.1264	:2127	1263:	Q-Q-K[.1]
U 1264.	0019.2000.05C0.0800.0000.1265	:2128	1264:	Q-Q-K[.1]
U 1265.	0019.2000.05C0.0800.0000.1266	:2129	1265:	Q-Q-K[.1]
U 1266.	0019.2000.05C0.0800.0000.1267	:2130	1266:	Q-Q-K[.1]
U 1267.	0019.2000.05C0.0800.0000.1268	:2131	1267:	Q-Q-K[.1]
U 1268.	0019.2000.05C0.0800.0000.1269	:2132	1268:	Q-Q-K[.1]
U 1269.	0019.2000.05C0.0800.0000.126A	:2133	1269:	Q-Q-K[.1]
U 126A.	0019.2000.05C0.0800.0000.126B	:2134	126A:	Q-Q-K[.1]
U 126B.	0019.2000.05C0.0800.0000.126C	:2135	126B:	Q-Q-K[.1]
U 126C.	0019.2000.05C0.0800.0000.126D	:2136	126C:	Q-Q-K[.1]
U 126D.	0019.2000.05C0.0800.0000.126E	:2137	126D:	Q-Q-K[.1]
U 126E.	0019.2000.05C0.0800.0000.126F	:2138	126E:	Q-Q-K[.1]
U 126F.	0019.2000.05C0.0800.0000.1270	:2139	126F:	Q-Q-K[.1]
U 1270.	0019.2000.05C0.0800.0000.1271	:2140	1270:	Q-Q-K[.1]
U 1271.	0019.2000.05C0.0800.0000.1272	:2141	1271:	Q-Q-K[.1]
U 1272.	0019.2000.05C0.0800.0000.1273	:2142	1272:	Q-Q-K[.1]
U 1273.	0019.2000.05C0.0800.0000.1274	:2143	1273:	Q-Q-K[.1]
U 1274.	0019.2000.05C0.0800.0000.1275	:2144	1274:	Q-Q-K[.1]
U 1275.	0019.2000.05C0.0800.0000.1276	:2145	1275:	Q-Q-K[.1]
U 1276.	0019.2000.05C0.0800.0000.1277	:2146	1276:	Q-Q-K[.1]
U 1277.	0019.2000.05C0.0800.0000.1278	:2147	1277:	Q-Q-K[.1]
U 1278.	0019.2000.05C0.0800.0000.1279	:2148	1278:	Q-Q-K[.1]
U 1279.	0019.2000.05C0.0800.0000.127A	:2149	1279:	Q-Q-K[.1]
U 127A.	0019.2000.05C0.0800.0000.127B	:2150	127A:	Q-Q-K[.1]
U 127B.	0019.2000.05C0.0800.0000.127C	:2151	127B:	Q-Q-K[.1]
U 127C.	0019.2000.05C0.0800.0000.127D	:2152	127C:	Q-Q-K[.1]
U 127D.	0019.2000.05C0.0800.0000.127E	:2153	127D:	Q-Q-K[.1]
U 127E.	0019.2000.05C0.0800.0000.127F	:2154	127E:	Q-Q-K[.1]
U 127F.	0019.2000.05C0.0800.0000.1280	:2155	127F:	Q-Q-K[.1]
U 1280.	0019.2000.05C0.0800.0000.1281	:2156	1280:	Q-Q-K[.1]
U 1281.	0019.2000.05C0.0800.0000.1282	:2157	1281:	Q-Q-K[.1]
U 1282.	0019.2000.05C0.0800.0000.1283	:2158	1282:	Q-Q-K[.1]
U 1283.	0019.2000.05C0.0800.0000.1284	:2159	1283:	Q-Q-K[.1]
U 1284.	0019.2000.05C0.0800.0000.1285	:2160	1284:	Q-Q-K[.1]
U 1285.	0019.2000.05C0.0800.0000.1286	:2161	1285:	Q-Q-K[.1]
U 1286.	0019.2000.05C0.0800.0000.1287	:2162	1286:	Q-Q-K[.1]
U 1287.	0019.2000.05C0.0800.0000.1288	:2163	1287:	Q-Q-K[.1]
U 1288.	0019.2000.05C0.0800.0000.1289	:2164	1288:	Q-Q-K[.1]
U 1289.	0019.2000.05C0.0800.0000.128A	:2165	1289:	Q-Q-K[.1]
U 128A.	0019.2000.05C0.0800.0000.128B	:2166	128A:	Q-Q-K[.1]
U 128B.	0019.2000.05C0.0800.0000.128C	:2167	128B:	Q-Q-K[.1]
U 128C.	0019.2000.05C0.0800.0000.128D	:2168	128C:	Q-Q-K[.1]
U 128D.	0019.2000.05C0.0800.0000.128E	:2169	128D:	Q-Q-K[.1]
U 128E.	0019.2000.05C0.0800.0000.128F	:2170	128E:	Q-Q-K[.1]
U 128F.	0019.2000.05C0.0800.0000.1290	:2171	128F:	Q-Q-K[.1]
U 1290.	0019.2000.05C0.0800.0000.1291	:2172	1290:	Q-Q-K[.1]
U 1291.	0019.2000.05C0.0800.0000.1292	:2173	1291:	Q-Q-K[.1]
U 1292.	0019.2000.05C0.0800.0000.1293	:2174	1292:	Q-Q-K[.1]
U 1293.	0019.2000.05C0.0800.0000.1294	:2175	1293:	Q-Q-K[.1]

U	1294.	0019.	2000.	05C0.	0800.	0000.	1295	:	2176	1294:	Q-Q-K[.1]
U	1295.	0019.	2000.	05C0.	0800.	0000.	1296	:	2177	1295:	Q-Q-K[.1]
U	1296.	0019.	2000.	05C0.	0800.	0000.	1297	:	2178	1296:	Q-Q-K[.1]
U	1297.	0019.	2000.	05C0.	0800.	0000.	1298	:	2179	1297:	Q-Q-K[.1]
U	1298.	0019.	2000.	05C0.	0800.	0000.	1299	:	2180	1298:	Q-Q-K[.1]
U	1299.	0019.	2000.	05C0.	0800.	0000.	129A	:	2181	1299:	Q-Q-K[.1]
U	129A.	0019.	2000.	05C0.	0800.	0000.	129B	:	2182	129A:	Q-Q-K[.1]
U	129B.	0019.	2000.	05C0.	0800.	0000.	129C	:	2183	129B:	Q-Q-K[.1]
U	129C.	0019.	2000.	05C0.	0800.	0000.	129D	:	2184	129C:	Q-Q-K[.1]
U	129D.	0019.	2000.	05C0.	0800.	0000.	129E	:	2185	129D:	Q-Q-K[.1]
U	129E.	0019.	2000.	05C0.	0800.	0000.	129F	:	2186	129E:	Q-Q-K[.1]
U	129F.	0019.	2000.	05C0.	0800.	0000.	12A0	:	2187	129F:	Q-Q-K[.1]
U	12A0.	0019.	2000.	05C0.	0800.	0000.	12A1	:	2188	12A0:	Q-Q-K[.1]
U	12A1.	0019.	2000.	05C0.	0800.	0000.	12A2	:	2189	12A1:	Q-Q-K[.1]
U	12A2.	0019.	2000.	05C0.	0800.	0000.	12A3	:	2190	12A2:	Q-Q-K[.1]
U	12A3.	0019.	2000.	05C0.	0800.	0000.	12A4	:	2191	12A3:	Q-Q-K[.1]
U	12A4.	0019.	2000.	05C0.	0800.	0000.	12A5	:	2192	12A4:	Q-Q-K[.1]
U	12A5.	0019.	2000.	05C0.	0800.	0000.	12A6	:	2193	12A5:	Q-Q-K[.1]
U	12A6.	0019.	2000.	05C0.	0800.	0000.	12A7	:	2194	12A6:	Q-Q-K[.1]
U	12A7.	0019.	2000.	05C0.	0800.	0000.	12A8	:	2195	12A7:	Q-Q-K[.1]
U	12A8.	0019.	2000.	05C0.	0800.	0000.	12A9	:	2196	12A8:	Q-Q-K[.1]
U	12A9.	0019.	2000.	05C0.	0800.	0000.	12AA	:	2197	12A9:	Q-Q-K[.1]
U	12AA.	0019.	2000.	05C0.	0800.	0000.	12AB	:	2198	12AA:	Q-Q-K[.1]
U	12AB.	0019.	2000.	05C0.	0800.	0000.	12AC	:	2199	12AB:	Q-Q-K[.1]
U	12AC.	0019.	2000.	05C0.	0800.	0000.	12AD	:	2200	12AC:	Q-Q-K[.1]
U	12AD.	0019.	2000.	05C0.	0800.	0000.	12AE	:	2201	12AD:	Q-Q-K[.1]
U	12AE.	0019.	2000.	05C0.	0800.	0000.	12AF	:	2202	12AE:	Q-Q-K[.1]
U	12AF.	0019.	2000.	05C0.	0800.	0000.	12B0	:	2203	12AF:	Q-Q-K[.1]
U	12B0.	0019.	2000.	05C0.	0800.	0000.	12B1	:	2204	12B0:	Q-Q-K[.1]
U	12B1.	0019.	2000.	05C0.	0800.	0000.	12B2	:	2205	12B1:	Q-Q-K[.1]
U	12B2.	0019.	2000.	05C0.	0800.	0000.	12B3	:	2206	12B2:	Q-Q-K[.1]
U	12B3.	0019.	2000.	05C0.	0800.	0000.	12B4	:	2207	12B3:	Q-Q-K[.1]
U	12B4.	0019.	2000.	05C0.	0800.	0000.	12B5	:	2208	12B4:	Q-Q-K[.1]
U	12B5.	0019.	2000.	05C0.	0800.	0000.	12B6	:	2209	12B5:	Q-Q-K[.1]
U	12B6.	0019.	2000.	05C0.	0800.	0000.	12B7	:	2210	12B6:	Q-Q-K[.1]
U	12B7.	0019.	2000.	05C0.	0800.	0000.	12B8	:	2211	12B7:	Q-Q-K[.1]
U	12B8.	0019.	2000.	05C0.	0800.	0000.	12B9	:	2212	12B8:	Q-Q-K[.1]
U	12B9.	0019.	2000.	05C0.	0800.	0000.	12BA	:	2213	12B9:	Q-Q-K[.1]
U	12BA.	0019.	2000.	05C0.							

U 12CB,	0019,2000,05C0,0800,0000,12CC	:2231	12CB:	Q-Q-K[.1]
U 12CC,	0019,2000,05C0,0800,0000,12CD	:2232	12CC:	Q-Q-K[.1]
U 12CD,	0019,2000,05C0,0800,0000,12CE	:2233	12CD:	Q-Q-K[.1]
U 12CE,	0019,2000,05C0,0800,0000,12CF	:2234	12CE:	Q-Q-K[.1]
U 12CF,	0019,2000,05C0,0800,0000,12D0	:2235	12CF:	Q-Q-K[.1]
U 12D0,	0019,2000,05C0,0800,0000,12D1	:2236	12D0:	Q-Q-K[.1]
U 12D1,	0019,2000,05C0,0800,0000,12D2	:2237	12D1:	Q-Q-K[.1]
U 12D2,	0019,2000,05C0,0800,0000,12D3	:2238	12D2:	Q-Q-K[.1]
U 12D3,	0019,2000,05C0,0800,0000,12D4	:2239	12D3:	Q-Q-K[.1]
U 12D4,	0019,2000,05C0,0800,0000,12D5	:2240	12D4:	Q-Q-K[.1]
U 12D5,	0019,2000,05C0,0800,0000,12D6	:2241	12D5:	Q-Q-K[.1]
U 12D6,	0019,2000,05C0,0800,0000,12D7	:2242	12D6:	Q-Q-K[.1]
U 12D7,	0019,2000,05C0,0800,0000,12D8	:2243	12D7:	Q-Q-K[.1]
U 12D8,	0019,2000,05C0,0800,0000,12D9	:2244	12D8:	Q-Q-K[.1]
U 12D9,	0019,2000,05C0,0800,0000,12DA	:2245	12D9:	Q-Q-K[.1]
U 12DA,	0019,2000,05C0,0800,0000,12DB	:2246	12DA:	Q-Q-K[.1]
U 12DB,	0019,2000,05C0,0800,0000,12DC	:2247	12DB:	Q-Q-K[.1]
U 12DC,	0019,2000,05C0,0800,0000,12DD	:2248	12DC:	Q-Q-K[.1]
U 12DD,	0019,2000,05C0,0800,0000,12DE	:2249	12DD:	Q-Q-K[.1]
U 12DE,	0019,2000,05C0,0800,0000,12DF	:2250	12DE:	Q-Q-K[.1]
U 12DF,	0019,2000,05C0,0800,0000,12E0	:2251	12DF:	Q-Q-K[.1]
U 12E0,	0019,2000,05C0,0800,0000,12E1	:2252	12E0:	Q-Q-K[.1]
U 12E1,	0019,2000,05C0,0800,0000,12E2	:2253	12E1:	Q-Q-K[.1]
U 12E2,	0019,2000,05C0,0800,0000,12E3	:2254	12E2:	Q-Q-K[.1]
U 12E3,	0019,2000,05C0,0800,0000,12E4	:2255	12E3:	Q-Q-K[.1]
U 12E4,	0019,2000,05C0,0800,0000,12E5	:2256	12E4:	Q-Q-K[.1]
U 12E5,	0019,2000,05C0,0800,0000,12E6	:2257	12E5:	Q-Q-K[.1]
U 12E6,	0019,2000,05C0,0800,0000,12E7	:2258	12E6:	Q-Q-K[.1]
U 12E7,	0019,2000,05C0,0800,0000,12E8	:2259	12E7:	Q-Q-K[.1]
U 12E8,	0019,2000,05C0,0800,0000,12E9	:2260	12E8:	Q-Q-K[.1]
U 12E9,	0019,2000,05C0,0800,0000,12EA	:2261	12E9:	Q-Q-K[.1]
U 12EA,	0019,2000,05C0,0800,0000,12EB	:2262	12EA:	Q-Q-K[.1]
U 12EB,	0019,2000,05C0,0800,0000,12EC	:2263	12EB:	Q-Q-K[.1]
U 12EC,	0019,2000,05C0,0800,0000,12ED	:2264	12EC:	Q-Q-K[.1]
U 12ED,	0019,2000,05C0,0800,0000,12EE	:2265	12ED:	Q-Q-K[.1]
U 12EE,	0019,2000,05C0,0800,0000,12EF	:2266	12EE:	Q-Q-K[.1]
U 12EF,	0019,2000,05C0,0800,0000,12F0	:2267	12EF:	Q-Q-K[.1]
U 12F0,	0019,2000,05C0,0800,0000,12F1	:2268	12F0:	Q-Q-K[.1]
U 12F1,	0019,2000,05C0,0800,0000,12F2	:2269	12F1:	Q-Q-K[.1]
U 12F2,	0019,2000,05C0,0800,0000,12F3	:2270	12F2:	Q-Q-K[.1]
U 12F3,	0019,2000,05C0,0800,0000,12F4	:2271	12F3:	Q-Q-K[.1]
U 12F4,	0019,2000,05C0,0800,0000,12F5	:2272	12F4:	Q-Q-K[.1]
U 12F5,	0019,2000,05C0,0800,0000,12F6	:2273	12F5:	Q-Q-K[.1]
U 12F6,	0019,2000,05C0,0800,0000,12F7	:2274	12F6:	Q-Q-K[.1]
U 12F7,	0019,2000,05C0,0800,0000,12F8	:2275	12F7:	Q-Q-K[.1]
U 12F8,	0019,2000,05C0,0800,0000,12F9	:2276	12F8:	Q-Q-K[.1]
U 12F9,	0019,2000,05C0,0800,0000,12FA	:2277	12F9:	Q-Q-K[.1]
U 12FA,	0019,2000,05C0,0800,0000,12FB	:2278	12FA:	Q-Q-K[.1]
U 12FB,	0019,2000,05C0,0800,0000,12FC	:2279	12FB:	Q-Q-K[.1]
U 12FC,	0019,2000,05C0,0800,0000,12FD	:2280	12FC:	Q-Q-K[.1]
U 12FD,	0019,2000,05C0,0800,0000,12FE	:2281	12FD:	Q-Q-K[.1]
U 12FE,	0019,2000,05C0,0800,0000,12FF	:2282	12FE:	Q-Q-K[.1]
U 12FF,	0019,2002,05C0,0800,0000,0001	:2283	12FF:	Q-Q-K[.1], RETURN1
		:2284		
		:2285		

U 1008, 0000,003D,0180,0800,0000,115B
U 1009, 0018,0038,0980,09F8,0000,100A
U 100A, 0818,0039,5D80,0800,0000,1182
U 100B, 0001,003C,0180,0A88,0000,119B
U 119B, 0018,0038,4180,0A80,0000,100C

U 100C, 0000,003D,0180,0800,0000,1189

```
2309 .PAGE 'TEST 131 IB REQUEST AND COUNT TEST'
2310 .*****
2311 .++
2312 .
2313 .TEST 131 IB REQUEST AND COUNT TEST
2314 .
2315 .TEST DESCRIPTION
2316 .
2317 .THIS TEST CHECKS ALL THE CONDITIONS THAT CAUSE 'IB REQ' AND
2318 . 'COUNT' TO ASCERT OR BE BLOCKED.
2319 .
2320 .SUBTEST 1 - IB RUNNING * BUFFER FULL * PC EVEN * -SAVE
2321 .CHECK THAT VIBA DOES NOT INCREMENT
2322 .SUBTEST 2 - IB RUNNING * FLUSH
2323 .CHECK THAT PIBA DOES NOT INCREMENT
2324 .AND THAT THE BUFFER DOES NOT GET ANY DATA
2325 .SUBTEST 3 - -IB RUNNING * BUFFER EMPTY * ALLOW.IB.READ
2326 .CHECK THAT THE BUFFER DOES NOT GET ANY DATA
2327 .SUBTEST 4 - IB RUNNING * BUFFER FULL * BDEST * PC EVEN
2328 .CHECK THAT THE VIBA DOES NOT INCREMENT
2329 .SUBTEST 5 - IB RUNNING * BUFFER FULL * -SAVE * -PC EVEN * CLR.0.1
2330 .CHECK THAT BYTE 7 GETS LOADED WITH VALID DATA
2331 .SUBTEST 6 - IB RUNNING * BUFFER FULL * -SAVE * CLR.0-3
2332 .CHECK THAT THE VIBA INCREMENTS
2333 .SUBTEST 7 - IB RUNNING * BUFFER FULL * SAVE * PC EVEN * CLR.1-5.COND
2334 .CHECK THAT THE VIBA DOES NOT INCREMENT
2335 .SUBTEST 8 - CHECK THAT A FLUSH DURING 'IB READ DATA' INHIBITS THE
2336 .VIBA FROM COUNTING.
2337 .SUBTEST 9 - CHECK THAT THE VIBA DOES NOT INCREMENT WHEN THE
2338 .PC IS NOT EVEN AND BYTE 7 FILLS WITH DATA.
2339 .
2340 .LOGIC DESCRIPTION
2341 .
2342 .THIS TEST CHECKS THE 'IB REQ' AND 'COUNT' LOGIC ON THE IDP MODULE.
2343 .
2344 .ERROR DESCRIPTION
2345 .
2346 .DATA: EXPECTED VIBA OR UPC<7:0>
2347 .RECEIVED VIBA OR UPC<7:0>
2348 .--
2349 .*****
2350 .
2351 .=0
2352 .T131: NEWTST
2353 .RC[0F] K[.2]
2354 .D K[.7],CALL[DCE] : GENERATE STALL MICRO ADDRESS
2355 .R[1]_D : SAVE
2356 .R[0]_K[.80] : EQUALS 80
2357 .
2358 .:////////////////////
2359 .+
2360 .:CHECK THAT THE VIBA DOES NOT INCREMENT IF THE BUFFER IS FULL.
2361 .:-
2362 .
2363 .=0
2363 .T131S1: SUBTEST
```

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U 100D, 0018,0038,C580,09F0,0000,100E :2364      RC[0E]_K[.88]          ; SET THE EXPECTED VIBA.
U 100E, 0000,003D,0180,0800,0000,116F :2365      =0      ERLOOP
U 100F, 0000,003C,0180,0800,0000,1010 :2366      NOP
U 1010, 2000,003D,0180,0A00,4200,1194 :2367      =0      ALU_R0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 1011, 3000,003C,0180,F800,0000,119C :2368      IBC7START,MCT/ALLOW.IB.READ ; START THE IB AGAIN
U 119C, 0000,003C,0180,F800,0000,119D :2369      MCT/ALLOW.IB.READ ; WAIT AND SEE IF ANOTHER REQ IS MADE
U 119D, 0000,003C,0180,F800,0000,119E :2370      MCT/ALLOW.IB.READ
U 119E, 1000,003C,0180,F800,0000,119F :2371      MCT/ALLOW.IB.READ,IBC/STOP
U 119F, 0810,0038,0180,0972,0000,11A0 :2372      PC VIBA,D_RC[0E]          ; GET THE VIBA
U 11A0, 0014,0038,01C0,0800,0000,11A1 :2373      Q_ALU,ALU_PC
U 11A1, 001D,A000,0180,0800,0010,11A2 :2374      ALU_Q-D,CLK.UBCC,BYTE ; CHECK IF ITS CORRECT
U 11A2, 0019,2134,49C0,0800,0000,1012 :2375      Z?,Q_Q.AND.K[.FF] ; BRANCH IF OK
U 1012, 0001,203D,0180,09E8,0000,1172 :2376      =0      ERROR2,RC[0D]_Q ; VIBA INCREMENTED
U 1013, 0000,003C,0180,0800,0000,1014 :2377      NOP
:2378
:2379      ;////////////////////
:2380      ;+
:2381      ; CHECK THAT FLUSH INHIBITS THE IB REQUEST.
:2382      ;--
:2383
:2384      =0
U 1014, 0000,003D,0180,0800,0000,1189 :2385      T131S2: SUBTEST
U 1015, 0000,003C,0180,0800,0000,1016 :2386      NOP
U 1016, 0000,003D,0180,0800,0000,116F :2387      =0      ERLOOP
U 1017, 2000,003C,0180,0A00,4200,11A3 :2388      ALU_R0],FLUSH.IB          ; LOAD THE VIBA
U 11A3, 3000,003C,0180,6000,0000,11A4 :2389      LOAD.IB,IBC/START ; START THE IB
U 11A4, 2000,003C,0180,F800,0000,11A5 :2390      IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A5, 2000,003C,0180,F800,0000,11A6 :2391      IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A6, 2000,003C,0180,F800,0000,11A7 :2392      IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A7, 2000,003C,0180,F800,0000,11A8 :2393      IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A8, 2000,003C,0180,F800,0000,11A9 :2394      IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A9, 1000,003C,0180,F800,0000,11AA :2395      IBC/STOP,MCT/ALLOW.IB.READ
U 11AA, 0000,003C,69F0,2C00,0000,11AB :2396      Q_ID[TIME.ADDR] ; READ THE PIBA
U 11AB, 0818,0038,4188,0800,0000,11AC :2397      Q_Q.LEFT2,D_K[.80] ; THROW AWAY MSB'S AND GET EXPECTED DATA
U 11AC, 0000,003C,01A8,0800,0000,11AD :2398      Q_Q.LEFT
U 11AD, 0000,003C,01B0,0800,0000,11AE :2399      Q_Q.RIGHT ; AND ALIGN
U 11AE, 0019,2034,49C0,0800,0000,11AF :2400      Q_Q.AND.K[.FF] ; MASK
U 11AF, 001D,2000,0180,0800,0010,11B0 :2401      ALU_Q-D,CLK.UBCC ; CHECK THE ADDRESS
U 11B0, 0001,013C,0180,09F0,0000,1018 :2402      Z?,RC[0E]_D
U 1018, 0001,203D,0180,09E8,0000,1172 :2403      =0      ERROR2,RC[0D]_Q ; PIBA INCREMENTED
:2404
:2405      ;+
:2406      ; CHECK THAT BUFFER DID NOT GET ANY DATA
:2407      ;--
:2408
:2409      D_R[1]
U 11B1, 0001,003C,0180,09F0,0000,101A :2410      RC[0E]_D ; SET THE EXPECTED UPC BITS
U 101A, 0000,003D,0180,0800,0000,118E :2411      =0      CALL[DISPAT] ; EXECUTE THE CALL 3
U 101B, 001D,2000,0180,0800,0010,11B2 :2412      ALU_Q-D,CLK.UBCC ; CHECK THE ADDRESS
U 11B2, 0000,013C,0180,0800,0000,101C :2413      Z?
U 101C, 0001,203D,0180,09E8,0000,1172 :2414      =0      ERROR2,RC[0D]_Q ; BYTE ZERO IS NOT INVALID
:2415
:2416      ;////////////////////
:2417      ;+
:2418      ; CHECK THAT THE IB DOES NOT GET ANY DATA IF IT IS NOT RUNNING

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:2419 :-
:2420
U 101D, 0000,003C,0180,0800,0000,101E :2421 T131S3: NOP
U 101E, 0000,003D,0180,0800,0000,1189 :2422 =0 SUBTEST
U 101F, 0000,003C,0180,0800,0000,1020 :2423 NOP
U 1020, 0000,003D,0180,0800,0000,116F :2424 =0 ERLOOP
U 1021, 2000,003C,0180,F800,0000,11B3 :2425 IBC/FLUSH,MCT/ALLOW.IB.READ ; FLUSH THE IB
U 11B3, 0800,003C,0180,FA08,0000,11B4 :2426 MCT/ALLOW.IB.READ,D RC1] ; SET EXPECTED DATA
U 11B4, 0001,003C,0180,F9F0,0000,11B5 :2427 MCT/ALLOW.IB.READ,RC[OE]_D ; ...
U 11B5, 0000,003C,0180,F800,0000,11B6 :2428 MCT/ALLOW.IB.READ
U 11B6, 0000,003C,0180,F800,0000,11B7 :2429 MCT/ALLOW.IB.READ
U 11B7, 0000,003C,0180,F800,0000,1022 :2430 MCT/ALLOW.IB.READ
U 1022, 0000,003D,0180,0800,0000,118E :2431 =0 CALL[DISPAT] ; EXECUTE THE CALL 3
U 1023, 0810,0038,0180,0970,0000,11B8 :2432 D RC[OE]
U 11B8, 001D,2000,0180,0800,0010,11B9 :2433 ALU_Q-D,CLK.UBCC ; CHECK THE ADDRESS
U 11B9, 0000,013C,0180,0800,0000,1024 :2434 Z?
U 1024, 0001,203D,0180,09E8,0000,1172 :2435 =0 ERROR2,RC[OD]_Q ; BYTE 0 IS NOT INVALID
:2436
:2437 :////////////////////
:2438 :+
:2439 : CHECK THAT BDEST DOES NOT ENABLE "IB REQ"
:2440 :-
:2441
U 1025, 0018,0038,C580,09F0,0000,1026 :2442 T131S4: RC[OE]_K[.88] ; SET THE EXPECTED VIBA
U 1026, 0000,003D,0180,0800,0000,1189 :2443 =0 SUBTEST
U 1027, 0000,003C,0180,0800,0000,1028 :2444 NOP
U 1028, 0000,003D,0180,0800,0000,116F :2445 =0 ERLOOP
U 1029, 0000,003C,0180,0800,0000,102A :2446 NOP
U 102A, 2000,003D,0180,0A00,4200,1194 :2447 =0 ALU RC[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 102B, 3000,003C,0180,0800,0000,11BA :2448 IBC7START ; START THE IB
U 11BA, 7000,003C,0180,F800,0000,11BB :2449 IBC/BDEST,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11BB, 7000,003C,0180,F800,0000,11BC :2450 IBC/BDEST,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11BC, 7000,003C,0180,F800,0000,11BD :2451 IBC/BDEST,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11BD, 1000,003C,0180,F800,0000,11BE :2452 IBC/STOP,MCT/ALLOW.IB.READ ; STOP THE IB
U 11BE, 0810,0038,0180,0972,0000,11BF :2453 PC VIBA,D RC[OE] ; GET THE VIBA
U 11BF, 0014,0038,01C0,0800,0000,11C0 :2454 Q ALU,ALU_PC
U 11C0, 001D,A000,0180,0800,0010,11C1 :2455 ALU_Q-D,C[.K.UBCC,BYTE ; CHECK THE ADDRESS
U 11C1, 0019,2134,49C0,0800,0000,102C :2456 Z?,Q.Q.AND,K[.FF] ; BRANCH IF OK
U 102C, 0001,203D,0180,09E8,0000,1172 :2457 =0 ERROR2,RC[OD]_Q ; VIBA INCREMENTED
:2458
:2459 :////////////////////
:2460 :+
:2461 : CHECK THAT CLR.O.1 CAUSES ANOTHER REQUEST TO BE MADE
:2462 :-
:2463
U 102D, 0800,003C,0180,0A00,0000,11C2 :2464 T131S5: D RC[0]
U 11C2, 0019,0014,0580,0A80,0000,102E :2465 RC[0]_D+K[.1] ; SET THE IB ADDRESS = 401(X)
U 102E, 0000,003D,0180,0800,0000,1189 :2466 =0 SUBTEST
U 102F, 0000,003C,0180,0800,0000,1030 :2467 NOP
U 1030, 0818,0039,0180,0800,0000,1183 :2468 =0 D K[.8],CALL[DCF] ; GENERATE UPC FOR "HALT" INSTR
U 1031, 0001,003C,0180,09F0,0000,1032 :2469 RC[OE]_D ; SAVE
U 1032, 0000,003D,0180,0800,0000,116F :2470 =0 ERLOOP
U 1033, 0000,003C,0180,0800,0000,1034 :2471 NOP
U 1034, 2000,003D,0180,0A00,4200,1194 :2472 =0 ALU RC[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 1035, 3000,003C,0180,0800,0000,11C3 :2473 IBC7START ; START THE IB AGAIN

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U 11C3, 4000,003C,0180,F800,0000,11C4 :2474 IBC/CLR.0.1,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11C4, 1000,003C,0180,F800,0000,11C5 :2475 MCT/ALLOW.IB.READ,IBC/STOP ; WAIT A CYCLE
U 11C5, E000,003C,0180,0800,0000,11C6 :2476 IBC/CLR.0-3 ; SHIFT BYTE 6 TO BYTE 0
U 11C6, 4000,003C,0180,0800,0000,1036 :2477 IBC/CLR.0.1 ;
U 1036, 0000,003D,0180,0800,0000,118E :2478 =0 CALL[DISPAT] ; EXECUTE CALL 3 ON BYTE 6
U 1037, 0810,0038,0180,0970,0000,11C7 :2479 D_RC[OE] ; GET EXPECTED DATA
U 11C7, 001D,2000,0180,0800,0010,11C8 :2480 ACU_Q-D,CLK.UBCC ; CHECK THE ADDRESS
U 11C8, 0000,013C,0180,0800,0000,1038 :2481 Z? ;
U 1038, 0001,203D,0180,09E8,0000,1172 :2482 =0 ERROR2,RC[OD]_Q ; BYTE 7 DID NOT GET VALIDATED

```

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:2483
:2484 :////////////////////
:2485 :+
:2486 : CHECK THAT THE VIBA INCREMENTS WHEN 4 BYTES ARE CLEARED
:2487 :-
:2488

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```

U 1039, 0800,003C,0180,0A00,0000,11C9 :2489 T131S6: D_RC[0]
U 11C9, 0019,0000,0580,0A80,0000,103A :2490 RC[0] D-K[.1] ; SET THE IB ADDRESS = 400(X)
U 103A, 0000,003D,0180,0800,0000,1189 :2491 =0 SUBTEST
U 103B, 0818,0038,4180,0800,0000,103C :2492 D_K[.80] ; SET THE EXPECTED DATA
U 103C, 0019,0031,8580,09F0,0000,116F :2493 =0 ERLOOP,RC[OE]_D.OR.K[.C]
U 103D, 0000,003C,0180,0800,0000,103E :2494 NOP
U 103E, 2000,003D,0180,0A00,4200,1194 :2495 =0 ALU_RC[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 103F, 3000,003C,0180,0800,0000,11CA :2496 IBC7START ; START THE BUFFER AGAIN
U 11CA, E000,003C,0180,F800,0000,11CB :2497 IBC/CLR.0-3,MCT/ALLOW.IB.READ ; SHOULD ASCERT REQUEST
U 11CB, 1000,003C,0180,F800,0000,11CC :2498 MCT/ALLOW.IB.READ,IBC/STOP ; STOP THE IB
U 11CC, 0810,0038,0180,0972,0000,11CD :2499 PC_VIBA,D_RC[OE] ; GET THE VIBA
U 11CD, 0014,0038,01C0,0800,0000,11CE :2500 Q_ALU,ALU_PC ;
U 11CE, 001D,A000,0180,0800,0010,11CF :2501 ACU_Q-D,C[.K.UBCC,BYTE ; CHECK THE ADDRESS
U 11CF, 0019,2134,49C0,0800,0000,1040 :2502 Z?,Q_Q.AND.K[.FF]
U 1040, 0001,203D,0180,09E8,0000,1172 :2503 =0 ERROR2,RC[OD]_Q ; VIBA DID NOT INCREMENT

```

```

:2504
:2505 :////////////////////
:2506 :+
:2507 : CHECK THAT SAVE INHIBITS AN IB REQUEST
:2508 :-
:2509

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U 1041, 0800,003C,0180,0A00,0000,11D0 :2510 T131S7: D_RC[0]
U 11D0, 0019,0014,1180,0A80,0000,1042 :2511 RC[0] D+K[.4] ; SET THE IB ADDRESS = 404(X)
U 1042, 0000,003D,0180,0800,0000,1189 :2512 =0 SUBTEST
U 1043, 0818,0038,4180,0800,0000,1044 :2513 D_K[.80] ; SET THE EXPECTED VIBA
U 1044, 0019,0031,8580,09F0,0000,116F :2514 =0 ERLOOP,RC[OE]_D.OR.K[.C]
U 1045, 0000,003C,0180,0800,0000,1046 :2515 NOP
U 1046, 2000,003D,0180,0A00,4200,1194 :2516 =0 ALU_RC[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 1047, 3000,003C,0180,0800,0000,11D1 :2517 IBC7START ; START THE IB
U 11D1, F000,003C,0180,F800,0000,11D2 :2518 IBC/CLR.1-5.COND,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11D2, 0000,003C,0180,F800,0000,11D3 :2519 MCT/ALLOW.IB.READ ; WAIT A LITTLE
U 11D3, 0000,003C,0180,F800,0000,11D4 :2520 MCT/ALLOW.IB.READ
U 11D4, 1000,003C,0180,F800,0000,11D5 :2521 MCT/ALLOW.IB.READ,IBC/STOP ; STOP THE IB
U 11D5, 0810,0038,0180,0972,0000,11D6 :2522 PC_VIBA,D_RC[OE] ; GET THE VIBA
U 11D6, 0014,0038,01C0,0800,0000,11D7 :2523 Q_ALU,ALU_PC ;
U 11D7, 001D,A000,0180,0800,0010,11D8 :2524 ACU_Q-D,C[.K.UBCC,BYTE ; CHECK THE ADDRESS
U 11D8, 0019,2134,49C0,0800,0000,1048 :2525 Z?,Q_Q.AND.K[.FF]
U 1048, 0001,203D,0180,09E8,0000,1172 :2526 =0 ERROR2,RC[OD]_Q ; VIBA INCREMENTED

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:2527
:2528 :////////////////////

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:2529
:2530 :+ CHECK THAT FLUSH INHIBITS THE VIBA COUNT
:2531 :-
:2532
U 1049, 0818,0038,4180,0800,0000,104A :2533 T131S8: D K[.80] ; SET THE EXPECTED DATA
U 104A, 0019,0031,1180,09F0,0000,1189 :2534 =0 SUBTEST,RC[OE],D.OR.K[.4]
U 104B, 0000,003C,0180,0800,0000,104C :2535 NOP
U 104C, 0000,003D,0180,0800,0000,116F :2536 =0 ERLOOP
U 104D, 2000,003C,0180,0A00,4200,11D9 :2537 ALU R[0],FLUSH.IB ; LOAD THE VA AND VIBA
U 11D9, 3000,003C,0180,6000,0000,11DA :2538 LOAD.IB,IBC/START ; START THE IB
U 11DA, 0000,003C,0180,F800,0000,11DB :2539 MCT/ALLOW.IB.READ ; WAIT ONE CYCLE
U 11DB, 2000,003C,0180,F800,0000,11DC :2540 IBC/FLUSH,MCT/ALLOW.IB.READ ; SHOULD BLOCK COUNT
U 11DC, 1000,003C,0180,0800,0000,11DD :2541 IBC/STOP ; STOP THE IB
U 11DD, 0810,0038,0180,0972,0000,11DE :2542 PC VIBA,D,RC[OE] ; GET THE VIBA
U 11DE, 0014,0038,01C0,0800,0000,11DF :2543 Q ALU,ALU-PC
U 11DF, 001D,A000,0180,0800,0010,11E0 :2544 ALU Q-D,C[K,UBCC,BYTE ; CHECK THE ADDRESS
U 11E0, 0019,2134,49C0,0800,0000,1050 :2545 Z?,Q.Q.AND.K[.FF]
U 1050, 0001,203D,0180,09E8,0000,1172 :2546 =0 ERROR2,RC[OD],Q ; VIBA INCREMENTED
:2547
:2548 :////////////////////
:2549 :+
:2550 : CHECK THAT THE PC BEING NOT EVEN INHIBITS THE VIBA COUNT
:2551 :-
:2552
U 1051, 0800,003C,0180,0A00,0000,11E1 :2553 T131S9: D R[0]
U 11E1, 0019,0000,0D80,0A80,0000,1052 :2554 R[0] D-K[.3] ; SET THE IB ADDRESS = 401(X)
U 1052, 0000,003D,0180,0800,0000,1189 :2555 =0 SUBTEST
U 1053, 0018,0038,C580,09F0,0000,1054 :2556 RC[OE],K[.88] ; SET THE EXPECTED DATA
U 1054, 0000,003D,0180,0800,0000,116F :2557 =0 ERLOOP
U 1055, 0000,003C,0180,0800,0000,1056 :2558 NOP
U 1056, 2000,003D,0180,0A00,4200,1194 :2559 =0 ALU R[0],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 1057, 3000,003C,0180,0800,0000,11E2 :2560 IBC7START ; START THE IB AGAIN
U 11E2, D000,003C,0180,F800,0000,11E3 :2561 IBC/CLR.1,MCT/ALLOW.IB.READ ; MAKE BYTE 7 INVALID
U 11E3, 0000,003C,0180,F800,0000,11E4 :2562 MCT/ALLOW.IB.READ ; LET BUFFER GET MORE DATA
U 11E4, 0000,003C,0180,F800,0000,11E5 :2563 MCT/ALLOW.IB.READ ; LET BUFFER GET MORE DATA
U 11E5, 1000,003C,0180,F800,0000,11E6 :2564 MCT/ALLOW.IB.READ,IBC/STOP ; LET BUFFER GET MORE DATA
U 11E6, 0810,0038,0180,0972,0000,11E7 :2565 PC VIBA,D,RC[OE] ; GET THE VIBA
U 11E7, 0014,0038,01C0,0800,0000,11E8 :2566 Q ALU,ALU-PC
U 11E8, 001D,A000,0180,0800,0010,11E9 :2567 ALU Q-D,C[K,UBCC,BYTE ; CHECK THE ADDRESS
U 11E9, 0019,2134,49C0,0800,0000,1058 :2568 Z?,Q.Q.AND.K[.FF]
U 1058, 0001,203D,0180,09E8,0000,1172 :2569 =0 ERROR2,RC[OD],Q ; VIBA INCREMENTED
U 1059, 0000,003C,0180,0800,0000,105C :2570 NOP
:2571
:2572 : FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2573 :% 80
:2574 :$ CFCF,0000,0000,0000,0000,0000
:2575

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:2576 .PAGE "TEST 132 VAX MODE SPECIFIER 1 CONSTANT"
:2577 *****
:2578 **
:2579 TEST 132 VAX MODE SPECIFIER 1 CONSTANT
:2580
:2581 TEST DESCRIPTION
:2582 THIS TEST CHECKS THAT THE FOUR POSSIBLE SP1 CONSTANTS ARE GENERATED
:2583 IN THE DATA PATH CORRECTLY. IT LOADS THE IB WITH OPCODES OF BYTE,
:2584 WORD, LONG, AND QUAD CONTEXT AND THEN READS THE SP1 CONSTANT INTO
:2585 THE Q REGISTER AND CHECKS IT.
:2586
:2587 LOGIC DESCRIPTION
:2588 THIS TEST CHECKS THE CONTEXT LATCH ON THE IRC MODULE AND THE SP1
:2589 INPUT TO THE KMX ON THE DCP MODULE.
:2590
:2591 ERROR DESCRIPTION
:2592 DATA: EXPECTED SP1 CONSTANT
:2593 RECEIVED SP1 CONSTANT
:2594 LOOP COUNT -- INDICATES WHICH CPCODE IS CURRENTLY IN THE IB.
:2595 I.E., 4=BYTE, 3=WORD, 2=LONG, AND 1=QUAD
:2596
:2597 SYNC POINT DESCRIPTION
:2598 ADDRESS SYNC00--CONTEXT SHOULD LATCH ON THE IRC MODULE
:2599 ADDRESS SYNC02--SP1 READ THRU THE KMX
:2600 --
:2601 *****
:2602 =0
:2603 T132: NEWTST[.3]
:2604 RC[1] 0 ; INIT ADDRESS OF IB DATA
:2605 RC[0E]_K[.1] ; INIT EXPECTED CONSTANT
:2606
:2607 //////////////////////////////////////
:2608 +
:2609 START THE TEST
:2610 -
:2611
:2612 T132S1: RC[0C]_K[.4] ; SET THE LOOP COUNT
:2613 =0 ERLOOP
:2614 T132L1: D RC[0E] ; GET EXP CONST
:2615 =0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2616 NOP
:2617 =0 CALL,J/DISPAT ; LOAD THE SP1 LATCH
:2618 SYNC02: Q K(SP1) ; READ THE CONSTANT
:2619 A[U_Q-D,CLK.UBCC,BYTE ; CHECK
:2620 Z? ; BRANCH IF OK
:2621 =0 ERROR2,RC[0D]_Q
:2622 LAB RC[1]
:2623 RC[1]_LA+K[.2] ; INCREMENT ADR OF IB DATA
:2624 D_RC[0E] ; GEN NEW EXP DATA
:2625 D-D.LEFT
:2626 RC[0E] D
:2627 D RC[0C] ; GET THE LOOP COUNT
:2628 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
:2629 Z?
:2630 =0 J/T132L1

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U 105C, 0018,0039,0D80,09F8,0000,115B
U 105D, 0003,003C,0180,0A88,0000,11EA
U 11EA, 0018,0038,0580,09F0,0000,11EB

U 11EB, 0018,0038,1180,09E0,0000,1060
U 1060, 0000,003D,0180,0800,0000,116F
U 1061, 0810,0038,0180,0970,0000,1062
U 1062, 2000,003D,0180,0A08,4200,1194
U 1063, 0000,003C,0180,0800,0000,1064
U 1064, 0000,003D,0180,0800,0000,118E
U 1065, 0018,0038,15C0,0800,0000,11EC
U 11EC, 001D,A000,0180,0800,0010,11ED
U 11ED, 0000,013C,0180,0800,0000,1066
U 1066, 0001,203D,0180,09E8,0000,1172
U 1067, 0000,003C,0180,0A08,0000,11EE
U 11EE, 0018,0014,0980,0A88,0000,11EF
U 11EF, 0810,0038,0180,0970,0000,11F0
U 11F0, 0500,003C,0180,0800,0000,11F1
U 11F1, 0001,003C,0180,09F0,0000,11F2
U 11F2, 0810,0038,0180,0960,0000,11F3
U 11F3, 0019,8000,0580,09E0,0010,11F4
U 11F4, 0000,013C,0180,0800,0000,1068
U 1068, 0000,003C,0180,0800,0000,1061


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:2639 .PAGE 'TEST 133 COMPATABILITY MODE SP1 AND SP2 CONSTANTS'
:2640 *****
:2641 ++
:2642 TEST 133 COMPATABILITY MODE SP1 AND SP2 CONSTANTS
:2643
:2644 TEST DESCRIPTION
:2645 THIS TEST USES 6 OPCODES TO CHECK THAT THE SP2 CONSTANT
:2646 IS GENERATED CORRECTLY AND 4 OPCODES TO CHECK THAT THE SP1 CONSTANT
:2647 IS GENERATED CORRECTLY.
:2648 THE DATA TABLE AT THE END OF THE TEST DESCRIBES THE EXPECTED CONSTANT
:2649 FOR EACH OF THE OPCODES.
:2650
:2651 SUBTST 1 - CHECK THE SP2 CONSTANT
:2652 SUBTST 2 - CHECK THE SP1 CONSTANT
:2653
:2654 LOGIC DESCRIPTION
:2655 THIS TEST CHECKS THE LOGIC THAT GENERATES THE SP1 AND SP2 CONSTANTS
:2656 ON THE IRC MODULE, AND THE SP2 CONSTANT INPUT TO THE KMX ON THE
:2657 DCP MODULE.
:2658
:2659 ERROR DESCRIPTION
:2660 DATA: EXPECTED SPECIFIER CONSTANT
:2661 RECEIVED SPECIFIER CONSTANT
:2662 LOOP COUNT -- DESCRIBES WHICH OPCODE IS CURRENTLY IN THE IB.
:2663
:2664 SYNC POINT DESCRIPTION
:2665 SUBTST 1 - SYNC03--SP2 CONSTANT IS LOADED INTO THE Q REGISTER
:2666 SUBTST 2 - SYNC04--SP1 CONSTANT IS LOADED INTO THE Q REGISTER
:2667 --
:2668 *****
:2669 =0
:2670 T133: NEWTST[.3]
:2671 RC[0E]_K[.1] ; INIT THE SP2 CONSTANT
:2672
:2673 //////////////////////////////////////////////////
:2674 +
:2675 FIRST CHECK THE SP2 CONSTANT
:2676 -
:2677
:2678 T133S1: RC[0C]_K[.6] ; SET THE LOOP COUNT
:2679 =0 SUBTEST
:2680 RC[1]_K[.8] ; SET ADR OF IB DATA
:2681 =0 ERLOOP
:2682 T133L1: NOP
:2683 =0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2684 NOP
:2685 =0 CALL,J/SETCM ; SET THE CM BIT
:2686 D_RC[0E]
:2687 SYNC03: Q_K[SP2.CON] ; READ THE CONSTANT
:2688 ALU_Q-D,CLK.UBCC ; CHECK
:2689 Z?
:2690 =0 ERROR2,RC[0D]_Q ; SP2 CONSTANT FAILED
:2691 LAB RC[1]
:2692 RC[1]_LA+K[.2] ; INCREMENT ADR OF IB DATA
:2693 D_RC[0C]

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U 106A, 0018,0039,0D80,09F8,0000,115B
U 106B, 0018,0038,0580,09F0,0000,11F5

U 11F5, 0018,0038,D580,09E0,0000,106C
U 106C, 0000,003D,0180,0800,0000,1189
U 106D, 0018,0038,0180,0A88,0000,106E
U 106E, 0000,003D,0180,0800,0000,116F
U 106F, 0000,003C,0180,0800,0000,1070
U 1070, 2000,003D,0180,0A08,4200,1194
U 1071, 0000,003C,0180,0800,0000,1072
U 1072, 0000,003D,0180,0800,0000,118F
U 1073, 0810,0038,0180,0970,0000,11F6
U 11F6, 0018,0038,19C0,0800,0000,11F7
U 11F7, 001D,2000,0180,0800,0010,11F8
U 11F8, 0000,013C,0180,0800,0000,1074
U 1074, 0001,203D,0180,09E8,0000,1172
U 1075, 0000,003C,0180,0A08,0000,11F9
U 11F9, 0018,0014,0980,0A88,0000,11FA
U 11FA, 0810,0038,0180,0960,0000,11FB

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U 11FB, 0019,8000,0D80,0800,0010,11FC :2694      ALU_D-K[.3],CLK.UBCC,BYTE      ; TIME TO CHANGE EXPEXED DATA?
U 11FC, 0000,013C,0180,0800,0000,1076 :2695      Z?                          ; BRANCH IF YES
U 1076, 0000,003C,0180,0800,0000,11FD :2696      =0      J/CMT7P1
U 1077, 0018,0038,0980,09F0,0000,11FD :2697      RC[OE]_K[.2]
U 11FD, 0019,8000,0580,09E0,0010,11FE :2698      CMT7P1: RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 11FE, 0000,013C,0180,0800,0000,1078 :2699      Z?
U 1078, 0000,003C,0180,0800,0000,106F :2700      =0      J/T133L1
:2701
:2702
:2703      ;////////////////////////////////////
:2704      ;+
:2705      ; NOW CHECK THE SP1 CONSTANT
:2706      ;-
:2707
U 1079, 0018,0038,1180,09E0,0000,107A :2708      T133S2: RC[OC]_K[.4]          ; SET THE LOOP COUNT
U 107A, 0000,003D,0180,0800,0000,1189 :2709      =0      SUBTEST
U 107B, 0018,0038,0580,09F0,0000,107C :2710      RC[OE]_K[.1]          ; INIT EXPECTED VALUE
U 107C, 0000,003D,0180,0800,0000,116F :2711      =0      ERLOOP
U 107D, 0000,003C,0180,0800,0000,107E :2712      T133L2: NOP
U 107E, 2000,003D,0180,0A08,4200,1194 :2713      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 107F, 0000,003C,0180,0800,0000,1080 :2714      NOP
U 1080, 0000,003D,0180,0800,0000,118F :2715      =0      CALL,J/SETCM          ; SET THE CM BIT
U 1081, 0810,0038,0180,0970,0000,1082 :2716      D RC[OE]
U 1082, 0000,003D,0180,0800,0000,118E :2717      =0      CALL,J/DISPAT        ; LATCH THE CONSTANT
U 1083, 0018,0038,15C0,0800,0000,11FF :2718      SYNC04: Q_K[SP1.CON]        ; READ THE CONSTANT
U 11FF, 001D,2000,0180,0800,0010,1300 :2719      A[U_Q-D,CLK.UBCC          ; CHECK
U 1300, 0000,013C,0180,0800,0000,1084 :2720      Z?
U 1084, 0001,203D,0180,09E8,0000,1172 :2721      =0      ERROR2,RC[OD]_Q        ; SP2 CONSTANT FAILED
U 1085, 0000,003C,0180,0A08,0000,1301 :2722      LAB_R[1]
U 1301, 0018,0014,0980,0A88,0000,1302 :2723      RC[1]_LA+K[.2]          ; INCREMENT ADR OF IB DATA
U 1302, 0810,0038,0180,0960,0000,1303 :2724      D RC[OC]
U 1303, 0019,8000,0D80,0800,0010,1304 :2725      A[U_D-K[.3],CLK.UBCC,BYTE ; TIME TO CHANGE EXPEXED DATA?
U 1304, 0000,013C,0180,0800,0000,1086 :2726      Z?                          ; BRANCH IF YES
U 1086, 0000,003C,0180,0800,0000,1305 :2727      =0      J/CMT7P2
U 1087, 0018,0038,0980,09F0,0000,1305 :2728      RC[OE]_K[.2]
U 1305, 0019,8000,0580,09E0,0010,1306 :2729      CMT7P2: RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 1306, 0000,013C,0180,0800,0000,1088 :2730      Z?
U 1088, 0000,003C,0180,0800,0000,107D :2731      =0      J/T133L2
U 1089, 0000,003C,0180,0800,0000,108A :2732      NOP
:2733
:2734
:2735      ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2736      ;X 8
:2737      ; SUBTEST 1, LOOP COUNT EQUALS 6 THRU 1
:2738      ;$ C514
:2739      ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2740      ; 142424
:2741      ;$ A412
:2742      ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2743      ; 122022
:2744
:2745      ;$ 8CD4
:2746      ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2747      ; 106324
:2748

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:2749 :$ 8B12
:2750 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2751 :105422
:2752 :
:2753 :$ C506
:2754 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2755 :142406
:2756 :
:2757 :$ 4500
:2758 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2759 :042400
:2760 :OP CODES FOR SP1 CONSTANT
:2761 :SUBTEST 2, LOOP COUNT EQUALS 4 THRU 1
:2762 :$ C514
:2763 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2764 :142424
:2765 :
:2766 :$ C494
:2767 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2768 :142224
:2769 :
:2770 :$ C594
:2771 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2772 :142604
:2773 :
:2774 :$ 4494
:2775 :EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:2776 :042224
:2777 :
:2778 :
:2779 :
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:2780 .PAGE 'TEST 134 PC REGISTER INCREMENT BY 'N''
:2781 *****
:2782 ++
:2783 .TEST 134 PC REGISTER INCREMENT BY 'N'
:2784
:2785 .TEST DESCRIPTION
:2786 THIS TEST CHECKS THAT CONSTANTS OF 2, 5, AND 3 ARE GENERATED BY THE
:2787 IB FOR THE PC INCREMENT CIRCUIT.
:2788 THE IB IS LOADED WITH THREE DIFFERENT SPECIFIERS, THE PC IS CLEARED
:2789 THE PC IS THEN INCREMENTED BY THE IB DISPLACEMENT AND READ INTO
:2790 THE Q REGISTER AND CHECKED.
:2791
:2792 .LOGIC DESCRIPTION
:2793 THIS TEST CHECKS THAT THE SIGNALS 'DELTA PC 0', 'DELTA PC 1', AND
:2794 'DELTA PC 2', FROM THE IDP MODULE, CAN BE ADDED TO THE PC REGISTER
:2795 ON THE DCP MODULE.
:2796
:2797 .ERROR DESCRIPTION
:2798 DATA: EXPECTED VALUE OF THE PC REGISTER
:2799 RECEIVED VALUE OF THE PC REGISTER
:2800 LOOP COUNT - INDICATES THE EXPECTED PC INCREMENT VALUE
:2801 I.E. 3 = 2, 2 = 5, AND 1 = 3
:2802
:2803 .SYNC POINT DESCRIPTION
:2804 ADDRESS SYNCFE--DELTA PC SIGNALS ARE ADDED TO PC
:2805 --
:2806 *****
:2807 =0
U 108A, 0018,0039,0D80,09F8,0000,115B :2808 T134: NEWTST[.3]
U 108B, 0818,0038,7580,0800,0000,1307 :2809 D_K[.20]
U 1307, 0019,0014,0980,0A80,0000,1308 :2810 R[0]_D+K[.2] ; SET ADR OF EXPECTED DATA
U 1308, 0019,0000,1180,0A88,0000,1309 :2811 R[1]_D-K[.4] ; SET ADR OF IB DATA
:2812
:2813 //////////////////////////////////////
:2814 +
:2815 .START THE TEST
:2816 -
:2817
U 1309, 0018,0038,0D80,09E0,0000,130A :2818 T134S1: RC[0C]_K[.3] ; SET THE LOOP COUNT
U 130A, 0000,003C,0180,0A00,0200,130B :2819 T134L1: VA_R[0]
U 130B, 0000,803C,0180,C800,0000,130C :2820 D[BYTE]_CACHE.P ; FETCH EXP DATA
U 130C, 0803,803C,0180,0800,0000,130D :2821 D_D.OXT[BYTE]
U 130D, 0001,003C,0180,09F0,0000,108C :2822 RC[0E]_D ; SAVE
U 108C, 0000,003D,0180,0800,0000,116F :2823 =0 ERLOOP
U 108D, 0000,003C,0180,0800,0000,108E :2824 NOP
U 108E, 2000,003D,0180,0A08,4200,1194 :2825 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 108F, 0018,0038,1980,0800,0200,130E :2826 ALU_O(K),VA_ALU ; LOAD THE VA
U 130E, 0810,0038,0180,0971,0000,130F :2827 PC_VA,D_RC[0E] ; LOAD THE PC
U 130F, 0000,003C,0180,0807,0000,1310 :2828 SYNCFE: PC-PC+N ; INCREMENT THE PC
U 1310, 0014,0038,01C0,0800,0000,1311 :2829 Q_PC ; READ THE PC
U 1311, 001D,2000,0180,0800,0010,1312 :2830 ALU_Q-D,CLK.UBCC ; CHECK THE PC
U 1312, 0000,013C,0180,0800,0000,1090 :2831 Z? ; BRANCH IF OK
U 1090, 0001,203D,0180,09E8,0000,1172 :2832 =0 ERROR2,RC[0D]_Q
U 1091, 0000,003C,0180,0A08,0000,1313 :2833 LAB_R[1]
U 1313, 0018,0014,0980,0A88,0000,1314 :2834 R[1]_LA+K[.2] ; INCREMENT ADR OF IB DATA

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U 1314. 0000.003C.0180.0A00.0000.1315 :2835 LAB R[0]
U 1315. 0018.0014.0580.0A80.0000.1316 :2836 R[0] LA+K[.1] ; INCREMENT ADR OF EXP DATA
U 1316. 0810.0038.0180.0960.0000.1317 :2837 D RC[0C]
U 1317. 0019.8000.0580.09E0.0010.1318 :2838 R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 1318. 0000.013C.0180.0800.0000.1092 :2839 Z?
U 1092. 0000.003C.0180.0800.0000.130A :2840 =0 J/T134L1
U 1093. 0000.003C.0180.0800.0000.1094 :2841 NOP
:2842
:2843 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2844 :X 1C
:2845 :$ 9F90.8F90.C090
:2846 :X 22
:2847 ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:2848 :$ 0205.0003
:2849
:2850
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2851 PAGE "TEST 135 INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING"
2852 *****
2853 ++
2854 TEST 135 INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING
2855
2856 TEST DESCRIPTION
2857 THIS TEST CHECKS ALL THE POSSIBLE CONDITIONS THAT THE SCRATCH
2858 PADS CAN BE ADDRESSED BY THE IB. EACH SUBTEST FLOATS A ONE THRU THE
2859 SCRATCH PAD ADDRESS LINES BY LOADING SPECIFIERS INTO THE IB THAT HAVE
2860 A REGISTER FIELD OF 0, 1, 2, 4, AND 8.
2861 THE TEST STARTS BY LOADING ALL 16 OF THE RA AND RB SCRATCH PADS WITH
2862 THE ADDRESS OF THEMSELVES. EACH SUBTEST THEN LOADS THE IB DATA,
2863 LATCHES THE RA AND RB SCRATCH PADS, CHECKS LA, AND THEN CHECKS LB.
2864
2865 SUBTST 1 - RA AND RB ADDRESSED BY SPECIFIER 1
2866 SUBTST 2 - RA AND RB ADDRESSED BY SPECIFIER 2
2867 SUBTST 3 - RA AND RB ADDRESSED BY SPECIFIER 2 AND SPECIFIER 1 RESPECTIVELY.
2868 SUBTST 4 - RA AND RB ADDRESSED BY THE PREVIOUS REGISTER NUMBER (PRN)
2869 SUBTST 5 - RA AND RB ADDRESSED BY THE PRN PLUS 1. THIS SUBTEST
2870 CHECKS PRN'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
2871 THE ADDER IS WORKING CORRECTLY.
2872 SUBTST 6 - RA AND RB ADDRESSED BY THE SP1 PLUS 1. THIS SUBTEST
2873 CHECKS SP1'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
2874 THE ADDER IS WORKING CORRECTLY.
2875 SUBTST 7 - COMP MODE RA ADDRESSED BY SPECIFIER 1
2876 SUBTST 8 - COMP MODE RA ADDRESSED BY SPECIFIER 2
2877 SUBTST 9 - COMP MODE RA ADDRESSED BY PRN.OR.1. THIS SUBTEST
2878 CHECKS PRN'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
2879 COMP MODE DOES AN OR FUNCTION RATHER THAN AN ADD.
2880
2881 LOGIC DESCRIPTION
2882 THIS TEST CHECKS THE SPECIFIER 1 AND SPECIFIER 2 ADDRESS MULTIPLEXORS
2883 IN VAX AND COMPATABILITY MODE, AND THE PRN LATCH
2884 ON THE IDP MODULE, AND THE INSTRUCTION DEPENDENT INPUTS TO THE SCRATCH
2885 PAD ADDRESS MULTIPLEXORS ON THE DAP MODULE.
2886
2887 ERROR DESCRIPTION
2888 DATA: EXPECTED SCRATCH PAD ADDRESS
2889 RECEIVED SCRATCH PAD ADDRESS
2890 LOOP COUNT -- DESCRIBES THE CONTENTS OF BYTES 1 AND 2 IN THE
2891 INSTRUCTION BUFFER. (SEE THE DATA TABLE AT THE END OF THIS TEST)
2892
2893 SYNC POINT DESCRIPTION
2894 SUBTST 1 - SYNCFD--LA AND LB ARE LATCHED
2895 SUBTST 2 - SYNC05--LA AND LB ARE LATCHED
2896 SUBTST 3 - SYNC06--LA AND LB ARE LATCHED
2897 SUBTST 4 - SYNC00--PRN IS LATCHED ON THE IDP MODULE
2898 SYNC07--LA AND LB ARE LATCHED
2899 SUBTST 5 - SYNC08--LA AND LB ARE LATCHED
2900 SUBTST 6 - SYNC12--LAB IS LATCHED
2901 SUBTST 7 - SYNC09--LA IS LATCHED
2902 SUBTST 8 - SYNC0A--LA IS LATCHED
2903 SUBTST 9 - SYNC00--PRN IS LATCHED ON THE IDP MODULE
2904 SYNC13--LA IS LATCHED
2905

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```

:2906 *****
:2907 =0
:2908 T135: NEWTST[.3]
:2909 R[0]_0 ; INIT THE SCRATCH PADS
:2910 R[1]_K[.1]
:2911 R[2]_K[.2]
:2912 R[3]_K[.3]
:2913 R[4]_K[.4],D_ALU
:2914 R[5]_D+K[.1]-ALU
:2915 R[6]_K[.6]
:2916 R[7]_K[.7]
:2917 R[8]_K[.8]
:2918 R[9]_K[.9]
:2919 R[0A]_K[.A],D_ALU
:2920 R[0B]_D+K[.1]-
:2921 R[0C]_K[.C]
:2922 R[0D]_K[.D],D_ALU
:2923 R[0E]_D+K[.1]-
:2924 R[0F]_K[.F]
:2925 D_K[.8000],Q_0 ; INIT EXPECTED DATA
:2926 SC_K[.10]
:2927 D_BAL.SC
:2928 RC[0E]_D
:2929 RC[2]_D ; EQUALS 80000000
:2930 RC[1]_K[.28] ; SET ADR OF IB DATA
:2931 SC_K[.4] ; GENERATE MASK FOR BITS<3:0>
:2932 Q_MASK+1
:2933 RC[8]_NOT.Q ; SAVE IN RC 8
:2934
:2935 :////////////////////
:2936 :+
:2937 : RA AND RB SELECTED BY SP1
:2938 :-
:2939
:2940 T135S1: RC[0C]_0+K[.4]+1 ; SET THE LOOP COUNT
:2941 =0 SUBTEST
:2942 NOP
:2943 =0 ERLOOP
:2944 T135L1: D_RC[0E] ; GET EXPECTED DATA
:2945 =0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2946 SYNCFD: LAB_R(SP1) ; READ SP1 REGISTER
:2947 ALU_L[A-B]D,CLK.UBCC,BYTE ; CHECK THE REGISTER
:2948 Z? ; BRANCH IF OK
:2949 =0 ERROR2,RC[0D]_LA
:2950 D_RC[0E] ; GET EXPECTED DATA
:2951 LAB_R(SP1)
:2952 ALU_D-LB,CLK.UBCC,BYTE ; CHECK THE LB REGISTER
:2953 Z? ; BRANCH IF OK
:2954 =0 ERROR2,RC[0D]_LB
:2955
:2956 :+
:2957 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2958 :-
:2959
:2960 U 109F, 0810,0038,0180,0908,0000,1337 D_RC[1]

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U 1337, 0019,0014,1180,0988,0000,1338 :2961 RC[1] D+K[.4] ; INCREMENT ADR OF IB DATA
U 1338, 0010,0038,01C0,0970,0000,1339 :2962 Q_RC[OE]
U 1339, 0000,003C,00A8,0800,0000,133A :2963 Q-Q.LEFT,S1/ASHR ; GENERATE NEXT EXP DATA
U 133A, 0001,203C,0180,09F0,0000,133B :2964 RC[OE] Q
U 133B, 0810,0038,0180,0960,0000,133C :2965 D_RC[OE]
U 133C, 0019,8000,0580,09E0,0010,133D :2966 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 133D, 0000,013C,0180,0800,0000,10A0 :2967 Z?
U 10A0, 0000,003C,0180,0800,0000,1099 :2968 =0 J/T135L1
:2969
:2970 ;////////////////////
:2971 ;+
:2972 ; RA AND RB SELECTED BY SP2
:2973 ;-
:2974
U 10A1, 0018,0038,0580,09F0,0000,10A2 :2975 T135S2: RC[OE] K[.1] ; INIT EXPECTED DATA
U 10A2, 0000,003D,0180,0800,0000,1189 :2976 =0 SUBTEST
U 10A3, 0018,0038,2D80,0988,0000,133E :2977 RC[1] K[.28] ; INIT ADR OF IB DATA
U 133E, 0818,0038,1180,0800,0000,133F :2978 D_K[.4]
U 133F, 0019,0014,0580,09E0,0000,10A4 :2979 RC[OC]_D+K[.1] ; SET THE LOOP COUNT
U 10A4, 0000,003D,0180,0800,0000,116F :2980 =0 ERLOOP
U 10A5, 0810,0038,0180,0970,0000,10A6 :2981 T135L2: D_RC[OE] ; GET EXP DATA
U 10A6, 2010,0039,0180,0908,4200,1194 :2982 =0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10A7, 0000,003C,01C0,0848,0000,1340 :2983 SYNC05: LAB_R(SP2),Q_LA ; READ THE SELECTED REGISTER
U 1340, 0000,003C,0180,0940,0000,1341 :2984 LC_RC[8]
U 1341, 0011,2034,01C0,0800,0000,1342 :2985 Q_Q.AND.LC ; MASK BITS <3:0>
U 1342, 001D,A000,0180,0800,0010,1343 :2986 A[U_Q-D,CLK.UBCC,BYTE ; CHECK THE REGISTER
U 1343, 0000,013C,0180,0800,0000,10A8 :2987 Z? ; BRANCH IF OK
U 10A8, 0001,203D,0180,09E8,0000,1172 :2988 =0 ERROR2,RC[OD]_Q
:2989
:2990 ;+
:2991 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2992 ;-
:2993
U 10A9, 0810,0038,0180,0970,0000,1344 :2994 D_RC[OE] ; GET EXPECTED DATA
U 1344, 000C,0038,01C0,0848,0000,1345 :2995 LAB_R(SP2),Q_LB ; READ THE SELECTED REGISTER
U 1345, 0000,003C,0180,0940,0000,1346 :2996 LC_RC[8]
U 1346, 0011,2034,01C0,0800,0000,1347 :2997 Q_Q.AND.LC ; MASK BITS <3:0>
U 1347, 001D,A000,0180,0800,0010,1348 :2998 A[U_Q-D,CLK.UBCC,BYTE ; CHECK THE REGISTER
U 1348, 000C,013C,0180,0800,0000,10AA :2999 Z? ; BRANCH IF OK
U 10AA, 0001,203D,0180,09E8,0000,1172 :3000 =0 ERROR2,RC[OD]_Q
U 10AB, 0810,0038,0180,0908,0000,1349 :3001 D_RC[1]
U 1349, 0019,0014,1180,0988,0000,134A :3002 RC[1] D+K[.4] ; INCREMENT ADR OF IB DATA
U 134A, 0010,0038,01C0,0970,0000,134B :3003 Q_RC[OE]
U 134B, 0000,003C,00A8,0940,0000,134C :3004 Q-Q.LEFT,S1/ASHR,LC_RC[8] ; GENERATE NEXT EXP DATA
U 134C, 0011,2034,01C0,0800,0000,134D :3005 Q_Q.AND.LC ; MASK THE EXPECTED DATA
U 134D, 0001,203C,0180,09F0,0000,134E :3006 RC[OE] Q
U 134E, 0810,0038,0180,0960,0000,134F :3007 D_RC[OE]
U 134F, 0019,8000,0580,09E0,0010,1350 :3008 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 1350, 0000,013C,0180,0800,0000,10AC :3009 Z?
U 10AC, 0000,003C,0180,0800,0000,10A5 :3010 =0 J/T135L2
:3011
:3012 ;////////////////////
:3013 ;+
:3014 ; RA SELECTED BY SP2 AND RB SELECTED BY SP1
:3015

```



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:3016 :-
:3017
U 10AD, 0810,0038,0180,0910,0000,1351 :3018 T135S3: D RC[2] ; INIT EXP DATA
U 1351, 0001,003C,0180,09F0,0000,10AE :3019 RC[OE] D
U 10AE, 0000,003D,0180,0800,0000,1189 :3020 =0 SUBTEST
U 10AF, 0018,0038,2D80,0988,0000,1352 :3021 RC[1] K[.28] ; INIT ADR OF IB DATA
U 1352, 0818,0038,1180,0800,0000,1353 :3022 D K[.4]
U 1353, 0019,0014,0580,09E0,0000,10B0 :3023 RC[OC]_D+K[.1] ; INIT LOOP COUNT
U 10B0, 0000,003D,0180,0800,0000,116F :3024 =0 ERLOOP
U 10B1, 0810,0038,0180,0970,0000,10B2 :3025 T135L3: D RC[OE] ; GET EXP DATA
U 10B2, 2010,0039,0180,0908,4200,1194 :3026 =0 ACU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10B3, 000C,0038,01C0,0850,0000,1354 :3027 SYNC06: LAB R(SP2.SP1),Q_LB ; READ THE REGISTERS
U 1354, 0000,003C,0180,0940,0000,1355 :3028 LC RC[8]
U 1355, 0011,2034,01C0,0800,0000,1356 :3029 Q Q.AND.LC ; MASK BITS <3:0>
U 1356, 001D,A000,0180,0800,0010,1357 :3030 ACU_Q-D,CLK.UBCC,BYTE ; CHECK THE REGISTER
U 1357, 0000,013C,0180,0800,0000,10B4 :3031 Z? ; BRANCH IF OK
U 10B4, 0001,203D,0180,09E8,0000,1172 :3032 =0 ERROR2,RC[OD]_Q
U 10B5, 0010,0038,01C0,0970,0000,1358 :3033 Q_RC[OE]
U 1358, 0000,003C,00A8,0940,0000,1359 :3034 Q_Q.LEFT,SI/ASHR,LC_RC[8] ; GET EXP DATA
U 1359, 0011,2034,01C0,0800,0000,135A :3035 Q_Q.AND.LC ; MASK THE EXPECTED DATA
U 135A, 0001,203C,0180,09F0,0000,10B6 :3036 RC[OE]_Q
U 10B6, 0000,003D,0180,0800,0000,116F :3037 =0 ERLOOP
U 10B7, 0810,0038,0180,0970,0000,135B :3038 D RC[OE] ; GET EXP DATA
U 135B, 0000,003C,01C0,0850,0000,135C :3039 LAB R(SP2.SP1),Q_LA ; READ THE REGISTERS
U 135C, 0000,003C,0180,0940,0000,135D :3040 LC RC[8]
U 135D, 0011,2034,01C0,0800,0000,135E :3041 Q Q.AND.LC ; MASK BITS <3:0>
U 135E, 001D,A000,0180,0800,0010,135F :3042 ACU_Q-D,CLK.UBCC,BYTE ; CHECK THE REGISTER
U 135F, 0000,013C,0180,0800,0000,10B8 :3043 Z? ; BRANCH IF OK
U 10B8, 0001,203D,0180,09E8,0000,1172 :3044 =0 ERROR2,RC[OD]_Q
:3045
:3046 :+
:3047 THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3048 :-
:3049
U 10B9, 0810,0038,0180,0908,0000,1360 :3050 D RC[1]
U 1360, 0019,0014,1180,0988,0000,1361 :3051 RC[1] D+K[.4] ; INCREMENT ADR OF IB DATA
U 1361, 0810,0038,0180,0960,0000,1362 :3052 D RC[OC]
U 1362, 0019,8000,0580,09E0,0010,1363 :3053 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 1363, 0000,013C,0180,0800,0000,10BA :3054 Z?
U 10BA, 0000,003C,0180,0800,0000,10B1 :3055 =0 J/T135L3
:3056
:3057
:3058 :////////////////////
:3059 :+
:3060 RA AND RB SELECTED BY PRN
:3061 :-
:3062
U 10BB, 0810,0038,0180,0910,0000,1364 :3063 T135S4: D RC[2]
U 1364, 0001,003C,0180,09F0,0000,10BC :3064 RC[OE] D ; INIT EXPECTED DATA
U 10BC, 0000,003D,0180,0800,0000,1189 :3065 =0 SUBTEST
U 10BD, 0018,0038,2D80,0988,0000,1365 :3066 RC[1] K[.28] ; INIT ADR OF IB DATA
U 1365, 0818,0038,1180,0800,0000,1366 :3067 D K[.4]
U 1366, 0019,0014,0580,09E0,0000,10BE :3068 RC[OC]_D+K[.1] ; INIT LOOP COUNT
:3069
U 10BE, 0000,003D,0180,0800,0000,116F :3070 =0 ERLOOP
```

```

U 10BF, 0810,0038,0180,0970,0000,10C0 :3071
U 10C0, 2010,0039,0180,0908,4200,1194 :3072
U 10C1, 0000,003C,0180,0800,0000,10C2 :3073
U 10C2, 0000,003D,0180,0800,0000,118E :3074
U 10C3, D000,003C,0180,0800,0000,1367 :3075
U 1367, 0000,003C,0180,0858,0000,1368 :3076
U 1368, 001C,A000,0180,0800,0010,1369 :3077
U 1369, 0000,013C,0180,0800,0000,10C4 :3078
U 10C4, 0000,003D,0180,09E8,0000,1172 :3079
U 10C5, 0810,0038,0180,0970,0000,136A :3080
U 136A, 0000,003C,0180,0858,0000,136B :3081
U 136B, 000D,8000,0180,0800,0010,136C :3082
U 136C, 0000,013C,0180,0800,0000,10C6 :3083
U 10C6, 000C,0039,0180,09E8,0000,1172 :3084
                                     :3085
                                     :3086
                                     :3087
                                     :3088
                                     :3089
U 10C7, 0810,0038,0180,0908,0000,136D :3090
U 136D, 0019,0014,1180,0988,0000,136E :3091
U 136E, 0010,0038,01C0,0970,0000,136F :3092
U 136F, 0000,003C,00A8,0800,0000,1370 :3093
U 1370, 0001,203C,0180,09F0,0000,1371 :3094
U 1371, 0810,0038,0180,0960,0000,1372 :3095
U 1372, 0019,8000,0580,09E0,0010,1373 :3096
U 1373, 0000,013C,0180,0800,0000,10C8 :3097
U 10C8, 0000,003C,0180,0800,0000,10BF :3098
                                     :3099
                                     :3100
                                     :3101
                                     :3102
                                     :3103
                                     :3104
                                     :3105
U 10C9, 0810,0038,0180,0910,0000,1374 :3106
U 1374, 0001,003C,0180,09F0,0000,1375 :3107
U 1375, 0001,003C,0180,0998,0000,10CA :3108
U 10CA, 0000,003D,0180,0800,0000,1189 :3109
U 10CB, 0018,0038,2D80,0988,0000,1376 :3110
U 1376, 0018,0038,D580,09E0,0000,1377 :3111
                                     :3112
U 1377, 0010,0038,01C0,0918,0000,1378 :3113
U 1378, 0019,2014,05C0,0940,0000,1379 :3114
U 1379, 0011,2034,01C0,0800,0000,137A :3115
U 137A, 0001,203C,0180,09F0,0000,10CC :3116
U 10CC, 0000,003D,0180,0800,0000,116F :3117
U 10CD, 0810,0038,0180,0970,0000,10CE :3118
U 10CE, 2010,0039,0180,0908,4200,1194 :3119
U 10CF, 0000,003C,0180,0800,0000,10D0 :3120
U 10D0, 0000,003D,0180,0800,0000,118E :3121
U 10D1, D000,003C,0180,0800,0000,137B :3122
U 137B, 0000,003C,01C0,0860,00C7,137C :3123
U 137C, 0000,003C,0180,0940,0000,137D :3124
U 137D, 0011,2034,01C0,0800,0000,137E :3125

```

```

T135L4: D RC[0E] ; GET EXPECTED DATA
=0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
NOP
=0 CALL,J/DISPAT ; LOAD PRN
IBC/CLR.1 ; CHANGE INPUT TO PRN LATCH
SYNC07: LAB_R(PRN) ; READ PRN REGISTER
ALU_LA[A-B]D,CLK.UBCC,BYTE ; CHECK THE REGISTER
Z? ; BRANCH IF OK
=0 ERROR2,RC[0D],LA ; GET EXPECTED DATA
D RC[0E]
LAB_R(PRN) ; CHECK THE LB REGISTER
ALU_D-LB,CLK.UBCC,BYTE ; BRANCH IF OK
Z?
=0 ERROR2,RC[0D],LB

```

THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST

```

D RC[1]
RC[1] D+K[.4] ; INCREMENT ADR OF IB DATA
Q RC[0E]
Q-Q.LEFT,SI/ASHR ; GENERATE NEXT EXP DATA
RC[0E] Q
D RC[0E]
RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
Z?
=0 J/T135L4

```

```

////////////////////////////////////
+
RA AND RB SELECTED BY PRN+1
-

```

```

T135S5: D RC[2]
RC[0E] D
RC[3] D
=0 SUBTEST
RC[1] K[.28] ; INIT ADR OF IB DATA
RC[0C]_K[.6]

```

```

T135L6: Q RC[3] ; GEN EXP DATA
Q-Q+K[.1],LC_RC[8]
Q-Q.AND.LC ; MASK THE DATA
RC[0E] Q ; SAVE
=0 ERLOOP
D RC[0E]
=0 A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
NOP
=0 CALL,J/DISPAT
IBC/CLR.1
SYNC08: LAB_R(PRN+1),Q_LA ; READ THE REGISTERS
LC RC[8]
Q-Q.AND.LC ; MASK BITS <3:0>

```

```

U 137E, 001D,A000,0180,0800,0010,137F :3126      ALU_Q-D,CLK.UBCC,BYTE      ; CHECK THE REGISTER
U 137F, 0000,013C,0180,0800,0000,10D2 :3127      Z?
U 10D2, 0001,203D,0180,09E8,0000,1172 :3128      =0      ERROR2,RC[0D],Q
U 10D3, 000C,0038,01C0,0860,0000,1380 :3129      LAB_R(PRN+1),Q_LB      ; READ THE REGISTERS
U 1380, 0000,003C,0180,0940,0000,1381 :3130      LC_RC[8]
U 1381, 0011,2034,01C0,0800,0000,1382 :3131      Q_Q.AND.LC      ; MASK BITS <3:0>
U 1382, 0810,0038,0180,0970,0000,1383 :3132      D-RC[0E]
U 1383, 001D,A000,0180,0800,0010,1384 :3133      ALU_Q-D,CLK.UBCC,BYTE      ; CHECK THE REGISTER
U 1384, 0000,013C,0180,0800,0000,10D4 :3134      Z?      ; BRANCH IF OK
U 10D4, 0001,203D,0180,09E8,0000,1172 :3135      =0      ERROR2,RC[0D],Q
      :3136
      :3137
      :+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
      :-
      :3138
      :3139
      :3140
U 10D5, 0810,0038,0180,0908,0000,1385 :3141      D_RC[1]
U 1385, 0019,0014,1180,0988,0000,1386 :3142      RC[1],D+K[.4]      ; INCREMENT ADR OF IB DATA
U 1386, 0010,0038,01C0,0918,0000,1387 :3143      Q_RC[3]
U 1387, 0000,003C,00A8,0800,0000,1388 :3144      Q-Q.LEFT,S1/ASHR      ; GET. NEXT EXP DATA
U 1388, 0001,203C,0180,0998,0000,1389 :3145      RC[3],Q
U 1389, 0810,0038,0180,0960,0000,138A :3146      D_RC[0C]
U 138A, 0019,8000,0980,0800,0010,138B :3147      ALU_D-K[.2],CLK.UBCC,BYTE      ; SEE IF LOOP COUNT IS 2
U 138B, 0000,013C,0180,0800,0000,10D6 :3148      Z?      ; BRANCH IF YES
U 10D6, 0000,003C,0180,0800,0000,138C :3149      =0      J/T15P1      ; CONTINUE
U 10D7, 0018,0038,6180,0998,0000,138C :3150      RC[3],K[.F]      ; CHANGE EXP DATA
U 138C, 0019,8000,0580,09E0,0010,138D :3151      T15P1: RC[0C],D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 138D, 0000,013C,0180,0800,0000,10D8 :3152      Z?
U 10D8, 0000,003C,0180,0800,0000,1377 :3153      =0      J/T135L6
      :3154
      :3155      :////////////////////
      :3156      :+
      :3157      : RA AND RB SELECTED BY SP1+1
      :3158      :-
      :3159
U 10D9, 0810,0038,0180,0910,0000,138E :3160      T135S6: D_RC[2]
U 138E, 0001,003C,0180,09F0,0000,138F :3161      RC[0E],D
U 138F, 0001,003C,0180,0998,0000,10DA :3162      RC[3],D
U 10DA, 0000,003D,0180,0800,0000,1189 :3163      =0      SUBTEST
U 10DB, 0018,0038,2D80,0988,0000,1390 :3164      RC[1],K[.28]      ; INIT ADR OF IB DATA
U 1390, 0018,0038,D580,09E0,0000,1391 :3165      RC[0C],K[.6]
      :3166
U 1391, 0010,0038,01C0,0918,0000,1392 :3167      T135L9: Q_RC[3]      ; GEN EXP DATA
U 1392, 0019,2014,05C0,0940,0000,1393 :3168      Q-Q+K[.1],LC_RC[8]
U 1393, 0011,2034,01C0,0800,0000,1394 :3169      Q-Q.AND.LC      ; MASK THE DATA
U 1394, 0001,203C,0180,09F0,0000,10DC :3170      RC[0E],Q      ; SAVE
U 10DC, 0000,003D,0180,0800,0000,116F :3171      =0      ERLOOP
U 10DD, 0810,0038,0180,0970,0000,10DE :3172      D_RC[0E]
U 10DE, 2010,0039,0180,0908,4200,1194 :3173      =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DF, 0000,003C,01C0,0870,0000,1395 :3174      SYNC12: LAB_R(SP1+1),Q_LA      ; READ THE REGISTERS
U 1395, 0000,003C,0180,0940,0000,1396 :3175      LC_RC[8]
U 1396, 0011,2034,01C0,0800,0000,1397 :3176      Q_Q.AND.LC      ; MASK BITS <3:0>
U 1397, 001D,A000,0180,0800,0010,1398 :3177      ALU_Q-D,CLK.UBCC,BYTE      ; CHECK THE REGISTER
U 1398, 0000,013C,0180,0800,0000,10E0 :3178      Z?
U 10E0, 0001,203D,0180,09E8,0000,1172 :3179      =0      ERROR2,RC[0D],Q
U 10E1, 000C,0038,01C0,0870,0000,1399 :3180      LAB_R(SP1+1),Q_LB      ; READ THE REGISTERS
    
```



```

U 1399, 0000,003C,0180,0940,0000,139A :3181      LC RC[8]
U 139A, 0011,2034,01C0,0800,0000,139B :3182      Q_Q.AND,LC           ; MASK BITS <3:0>
U 139B, 0810,0038,0180,0970,0000,139C :3183      D-RC[0E]
U 139C, 001D,A000,0180,0800,0010,139D :3184      A[U_Q-D,CLK.UBCC,BYTE   ; CHECK THE REGISTER
U 139D, 0000,013C,0180,0800,0000,10E2 :3185      Z?                ; BRANCH IF OK
U 10E2, 0001,203D,0180,09E8,0000,1172 :3186      =0      ERROR2,RC[0D],Q
:3187
:3188      ;+
:3189      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3190      ;-
:3191
U 10E3, 0810,0038,0180,0908,0000,139E :3192      D RC[1]
U 139E, 0019,0014,1180,0988,0000,139F :3193      RC[1] D+K[.4]           ; INCREMENT ADR OF IB DATA
U 139F, 0010,0038,01C0,0918,0000,13A0 :3194      Q_RC[3]
U 13A0, 0000,003C,00A8,0800,0000,13A1 :3195      Q-Q.LEFT,S1/ASHR       ; GEN NEXT EXP DATA
U 13A1, 0001,203C,0180,0998,0000,13A2 :3196      RC[3] Q
U 13A2, 0810,0038,0180,0960,0000,13A3 :3197      D RC[0C]
U 13A3, 0019,8000,0980,0800,0010,13A4 :3198      A[U_D-K[.2],CLK.UBCC,BYTE ; SEE IF LOOP COUNT IS 2
U 13A4, 0000,013C,0180,0800,0000,10E4 :3199      Z?                ; BRANCH IF YES
U 10E4, 0000,003C,0180,0800,0000,13A5 :3200      =0      J/T15P2        ; CONTINUE
U 10E5, 0018,0038,0180,0998,0000,13A5 :3201      RC[3] K[.F]           ; CHANGE EXP DATA
U 13A5, 0019,8000,0580,09E0,0010,13A6 :3202      T15P2: RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 13A6, 0000,013C,0180,0800,0000,10E6 :3203      Z?
U 10E6, 0000,003C,0180,0800,0000,1391 :3204      =0      J/T135L9
:3205
:3206      ;////////////////////
:3207      ;+
:3208      ; NOW CHECK COMPATABILITY MODE SP1 ADDRESS
:3209      ;-
:3210
U 10E7, 0018,0038,0580,09F0,0000,10E8 :3211      T135S7: RC[0E] K[.1]           ; INIT EXPECTED DATA
U 10E8, 0000,003D,0180,0800,0000,1189 :3212      =0      SUBTEST
U 10E9, 0018,0038,0D80,09E0,0000,10EA :3213      RC[0C]_K[.3]           ; SET THE LOOP COUNT
U 10EA, 0000,003D,0180,0800,0000,116F :3214      =0      ERLOOP
U 10EB, 0000,003C,0180,0800,0000,10EC :3215      T135L7: NOP
U 10EC, 2010,0039,0180,0908,4200,1194 :3216      =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEN IB
U 10ED, 0000,003C,0180,0800,0000,10EE :3217      NOP
U 10EE, 0000,003D,0180,0800,0000,118F :3218      =0      CALL J/SETCM       ; SET THE CM BIT
U 10EF, 0810,0038,0180,0970,0000,13A7 :3219      D RC[0E]           ; GET EXPECTED REGISTER ADDRESS
U 13A7, 0000,003C,0180,0840,0000,13A8 :3220      SYNC09: LAB_R(SP1)       ; READ THE SELECTED REGISTER
U 13A8, 001C,A000,0180,0800,0010,13A9 :3221      ALU_LA[A-B]D,CLK.UBCC,BYTE ; CHECK
U 13A9, 0000,013C,0180,0800,0000,10F0 :3222      Z?
U 10F0, 0000,003D,0180,09E8,0000,1172 :3223      =0      ERROR2,RC[0D],LA           ; SP1 FAILED
:3224
:3225      ;+
:3226      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3227      ;-
:3228
U 10F1, 0810,0038,0180,0908,0000,13AA :3229      D RC[1]
U 13AA, 0019,0014,0980,0988,0000,13AB :3230      RC[1] D+K[.2]           ; INCREMENT ADR OF IB DATA
U 13AB, 0010,0038,01C0,0970,0000,13AC :3231      Q_RC[0E]
U 13AC, 0000,003C,00A8,0800,0000,13AD :3232      Q-Q.LEFT,S1/ASHR       ; GEN NEXT EXPECTED REGISTER
U 13AD, 0001,203C,0180,09F0,0000,13AE :3233      RC[0E] Q
U 13AE, 0810,0038,0180,0960,0000,13AF :3234      D RC[0C]
U 13AF, 0019,8000,0580,09E0,0010,13B0 :3235      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT

```



```

U 13B0, 0000,013C,0180,0800,0000,10F2 :3236
U 10F2, 0000,003C,0180,0800,0000,10EB :3237 =0 Z?
                                           J/T135L7
                                           :3238
                                           :3239
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U 10F3, 0018,0038,0580,09F0,0000,10F4 :3244 T135S8: RC[0E] K[.1] ; INIT EXPECTED DATA
U 10F4, 0000,003D,0180,0800,0000,1189 :3245 =0 SUBTEST
U 10F5, 0018,0038,0D80,09E0,0000,10F6 :3246 RC[0C] K[.3] ; SET THE LOOP COUNT
U 10F6, 0000,003D,0180,0800,0000,116F :3247 =0 ERLOOP
U 10F7, 0000,003C,0180,0800,0000,10F8 :3248 T135L8: NOP
U 10F8, 2010,0039,0180,0908,4200,1194 :3249 =0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F9, 0000,003C,0180,0800,0000,10FA :3250 NOP
U 10FA, 0000,003D,0180,0800,0000,118F :3251 =0 CALL J/SETCM ; SET CM MODE
U 10FB, 0810,0038,0180,0970,0000,13B1 :3252 D RC[0E]
U 13B1, 0000,003C,0180,0848,0000,13B2 :3253 SYNC0A: LAB_R(SP2) ; READ THE SELECTED SCRATCH PAD
U 13B2, 001C,A000,0180,0800,0010,13B3 :3254 ALU_LA[A-B]D,CLK.UBCC,BYTE ; CHECK THE REGISTER
U 13B3, 0000,013C,0180,0800,0000,10FC :3255 Z?
U 10FC, 0000,003D,0180,09E8,0000,1172 :3256 =0 ERROR2,RC[0D]_LA ; SP2 FAILED
                                           :3257
                                           :3258
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                                           :3290
U 10FD, 0810,0038,0180,0908,0000,13B4 :3262 D RC[1]
U 13B4, 0019,0014,0980,0988,0000,13B5 :3263 RC[1] D+K[.2] ; INCREMENT ADR OF IB DATA
U 13B5, 0010,0038,01C0,0970,0000,13B6 :3264 Q RC[0E]
U 13B6, 0000,003C,00A8,0800,0000,13B7 :3265 Q-Q.LEFT,SI/ASHR ; GEN NEXT EXPECTED REGISTER
U 13B7, 0001,203C,0180,09F0,0000,13B8 :3266 RC[0E] Q
U 13B8, 0810,0038,0180,0960,0000,13B9 :3267 D RC[0C]
U 13B9, 0019,8000,0580,09E0,0010,13BA :3268 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOP COUNT
U 13BA, 0000,013C,0180,0800,0000,10FE :3269 Z?
U 10FE, 0000,003C,0180,0800,0000,10F7 :3270 =0 J/T135L8
                                           :3271
                                           :3272
                                           :3273
                                           :3274
                                           :3275
                                           :3276
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                                           :3286
                                           :3287
                                           :3288
                                           :3289
                                           :3290
U 10FF, 0018,0038,0580,09F0,0000,13BB :3277 T135S9: RC[0E] K[.1] ; INIT EXPECTED DATA
U 13BB, 0018,0038,0580,0980,0000,110A :3278 RC[0] R[.1] ; SET SEED TO CALCULATE NEXT EXP DATA
U 110A, 0000,003D,0180,0800,0000,1189 :3279 =0 SUBTEST
U 110B, 0018,0038,0D80,09E0,0000,13BC :3280 RC[0C] K[.3] ; SET THE LOOP COUNT
U 13BC, 0018,0038,3180,0988,0000,1110 :3281 RC[1] R[.40] ; SET IB ADDRESS
U 1110, 0000,003D,0180,0800,0000,116F :3282 =0 ERLOOP
U 1111, 0000,003C,0180,0800,0000,1112 :3283 T135L10: NOP
U 1112, 2010,0039,0180,0908,4200,1194 :3284 =0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEN IB
U 1113, 0000,003C,0180,0800,0000,1114 :3285 NOP
U 1114, 0000,003D,0180,0800,0000,118E :3286 =0 CALL J/DISPAT ; LATCH THE PRN
U 1115, 0000,003C,0180,0800,0000,1116 :3287 NOP
U 1116, 0000,003D,0180,0800,0000,118F :3288 =0 CALL J/SETCM ; SET THE CM BIT
U 1117, 0810,0038,0180,0970,0000,13BD :3289 D RC[0E] ; GET EXPECTED REGISTER ADDRESS
U 13BD, 0000,003C,0180,0860,0000,13BE :3290 SYNC13: LAB_R(SRC!1) ; READ THE SELECTED REGISTER
    
```

U 13BE, 001C,A000,0180,0800,0010,13BF :3291
 U 13BF, 0000,013C,0180,0800,0000,1118 :3292
 U 1118, 0000,003D,0180,09E8,0000,1172 :3293

ALU_LACA-BJD,CLK.UBCC,BYTE ; CHECK
 Z?
 =0 ERROR2,RC[0D]_LA ; SP1 FAILED

THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST

U 1119, 0810,0038,0180,0908,0000,13C0 :3298
 U 13C0, 0019,0014,0980,0988,0000,13C1 :3299
 U 13C1, 0010,0038,01C0,0900,0000,13C2 :3300
 U 13C2, 0000,003C,00A8,0800,0000,13C3 :3301
 U 13C3, 0001,203C,0180,0980,0000,13C4 :3302
 U 13C4, 0019,2030,05C0,0800,0000,13C5 :3303
 U 13C5, 0001,203C,0180,09F0,0000,13C6 :3304
 U 13C6, 0810,0038,0180,0960,0000,13C7 :3305
 U 13C7, 0019,8000,0580,09E0,0010,13C8 :3306
 U 13C8, 0000,013C,0180,0800,0000,111A :3307
 U 111A, 0000,003C,0180,0800,0000,1111 :3308
 U 111B, 0000,003C,0180,0800,0000,111C :3309

D RC[1]
 RC[1] D+K[.2] ; INCREMENT ADR OF IB DATA
 Q RC[0]
 Q-Q.LEFT,S1/ASHR ; GEN NEXT EXPECTED REGISTER
 RC[0] Q
 Q Q.OR.K[.1]
 RC[0E] Q
 D RC[0C]
 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
 Z?
 =0 J/T135L10
 NOP

FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:

% 28
 SUBTESTS 1,2,3, AND 4 HAVE LOOP COUNTS FROM 5 THRU 1
 SUBTEST 5 AND 6 HAS A LOOP COUNT FROM 6 THRU 1
 THE FOLLOWING LOOP COUNT DESCRIPTIONS REFER TO SUBTEST 1,2,3, AND 4.
 IF SUBTEST 5 OR 6 FAILS, ADD ONE TO THE LOOP COUNT SHOWN HERE.

LOOP COUNT = 5
 \$ 0090,0001
 LOOP COUNT = 4
 \$ 0190,0002
 LOOP COUNT = 3
 \$ 0290,0004
 LOOP COUNT = 2
 \$ 0490,0008
 LOOP COUNT = 1
 \$ 0890,0000
 LOOP COUNT = 1, SUBTEST 5 AND 6 ONLY
 \$ 0F90,0000

OPCODES FOR SUBTEST 7 AND 9, LOOP COUNTS FROM 3 THRU 1

% 40
 \$ 1E48,1E88,1F08
 EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
 017110,017210,017410
 OPCODES FOR SUBTEST 8, LOOP COUNTS FROM 3 TO 1
 \$ 1C79,1C7A,1C7C
 EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
 016171,016172,016174

:3311
 :3312
 :3313
 :3314
 :3315
 :3316
 :3317
 :3318
 :3319
 :3320
 :3321
 :3322
 :3323
 :3324
 :3325
 :3326
 :3327
 :3328
 :3329
 :3330
 :3331
 :3332
 :3333
 :3334
 :3335
 :3336
 :3337
 :3338
 :3339
 :3340
 :3341
 :3342
 :3343

```

3344 .PAGE 'TEST 136 BMUX GETS PC OR LB FUNCTION'
3345 *****
3346 ++
3347 : TEST 136 BMUX GETS PC OR LB FUNCTION
3348
3349 : TEST DESCRIPTION
3350 : THIS TEST CHECKS THAT WHEN THE SPECIFIER 1 REGISTER IS THE PC
3351 : THAT THE BMUX GATES THE PC THRU AND WHEN IT'S NOT THE PC, THE
3352 : BMUX GATES THE LB THRU, WHEN EXECUTING THE BMX FUNCTION OF
3353 : 'PC.OR.LB'.
3354
3355 : LOGIC DESCRIPTION
3356 : THIS TEST CHECKS THE SIGNAL 'PC REG' ON THE IRC MODULE AND THE
3357 : BMUX SELECT LOGIC ON THE DAP MODULE.
3358
3359 : ERROR DESCRIPTION
3360 : DATA: EXPECTED DATA
3361 : RECEIVED DATA
3362 : LOOP COUNT - INDICATES WHEN THE SP1 IS EQUAL TO THE PC
3363 : I.E. 2 = PC, 1 = NOT PC
3364 : NOTE: THE PC IS SETUP TO CONTAIN -1 AND THE LB TO CONTAIN
3365 : ZERO SO THE RECEIVED DATA WILL SHOW WHICH REGISTER
3366 : WAS SELECTED, AND THE EXPECTED DATA SHOWS WHICH REGISTER
3367 : WAS SUPPOSE TO BE SELECTED.
3368
3369 : SYNC POINT DESCRIPTION
3370 : ADDRESS SYNC0B--BMUX SELECT IS ACTIVE
3371 --
3372 *****
3373 =0
3374 T136: NEWTST[.3]
3375 R[1]_K[.50] : INIT ADR OF IB DATA 50(16)
3376 ALU=-1,RC[OE]_ALU,VA_ALU : INIT EXPECTED DATA
3377 R[2]_0
3378
3379 : //////////////////////////////////////
3380 : +
3381 : START THE TEST
3382 : -
3383
3384 T136S1: RC[OC]_K[.2] : SET THE LOOP COUNT
3385 =0 ERLOOP
3386 T136L1: D RC[OE] : GET EXPECTED DATA
3387 =0 ACU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
3388 ALU=-1,VA_ALU
3389 PC VA
3390 LAB R[2] : PUT KNOWN DATA IN LB
3391 SYNC0B: BMX7PC.OR.LB,ALU/B,Q_ALU : READ THE BMX
3392 ALU_Q-D,CLK.UBCC : SELECT OK?
3393 Z? : BRANCH IF OK
3394 =0 ERROR2,RC[OD]_Q
3395 LAB R[1]
3396 R[1]_LA+K[.2] : INCREMENT ADR OF IB DATA
3397 RC[OE]_0 : SET EXP DATA
3398 D_RC[OC]

```

U 111C, 0018,0039,0D80,09F8,0000,115B
U 111D, 0018,0038,3580,0A88,0000,13C9
U 13C9, 0003,0028,0180,09F0,0200,13CA
U 13CA, 0003,003C,0180,0A90,0000,13CB

U 13CB, 0018,0038,0980,09E0,0000,111E
U 111E, 0000,003D,0180,0800,0000,116F
U 111F, 0810,0038,0180,0970,0000,1120
U 1120, 2000,003D,0180,0A08,4200,1194
U 1121, 0003,0028,0180,0800,0200,13CC
U 13CC, 0000,003C,0180,0801,0000,13CD
U 13CD, 0000,003C,0180,0A10,0000,13CE
U 13CE, 0004,0038,01C0,0800,0000,13CF
U 13CF, 001D,2000,0180,0800,0010,13D0
U 13D0, 0000,013C,0180,0800,0000,1122
U 1122, 0001,203D,0180,09E8,0000,1172
U 1123, 0000,003C,0180,0A08,0000,13D1
U 13D1, 0018,0014,0980,0A88,0000,13D2
U 13D2, 0003,003C,0180,09F0,0000,13D3
U 13D3, 0810,0038,0180,0960,0000,13D4

ZZ-ESKAH-V132 TEST 136 BMUX GETS PC OR LB FUNCTION
ESKAH37.MCR

MICRO2 1M(01) 16-DEC-82 12:20:29

G 14

SEQ 0995
Page 8

```
U 13D4, 0019,8000,0580,09E0,0010,13D5 :3399      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 13D5, 0000,013C,0180,0800,0000,1124 :3400      Z?
U 1124, 0000,003C,0180,0800,0000,111F :3401      =0      J/T136L1
U 1125, 0000,003C,0180,0800,0000,1126 :3402      NOP
:3403
:3404 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3405 :% 50
:3406 :$ 0F90,0090
:3407
:3408
```



```

3409 .PAGE "TEST 137 SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE"
3410 *****
3411 ++
3412 .TEST 137 SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE
3413
3414 .TEST DESCRIPTION
3415 THIS TEST CHECKS THAT THE SHIFTER IS SELECTED FOR THE CORRECT
3416 SHIFT FOR INSTRUCTION DEPENDENT DATA TYPES OF BYTE, WORD, LONG,
3417 AND QUAD. THIS IS DONE BY LOADING THE IB WITH THE SPECIFIC OPCODE
3418 FOR THE DATA TYPE, PUTTING A 1 THRU THE ALU AND SELECTING THE SHIFTER
3419 FOR DATA TYPE DEPENDENT, AND LOADING THE RESULT INTO THE Q REGISTER
3420 AND CHECKING IT.
3421
3422 .LOGIC DESCRIPTION
3423 THIS TEST CHECKS THE SHIFTER SELECT LOGIC FOR INSTRUCTION
3424 DEPENDENT DATA TYPE ON THE DAP MODULE.
3425
3426 .ERROR DESCRIPTION
3427 DATA: EXPECTED SHIFTER OUTPUT
3428 RECEIVED SHIFTER OUTPUT
3429 LOOP COUNT -- INDICATES THE DATA TYPE CURRENTLY BEING TEST,
3430 I.E. 4=QUAD, 3=LONG, 2=WORD, AND 1=BYTE.
3431
3432 .SYNC POINT DESCRIPTION
3433 ADDRESS SYNCOC--DATA IS GATED THRU THE SHIFTER
3434 --
3435 *****
3436 =0
3437 T137: NEWTST[.3]
3438 D_K[.50]
3439 R[1] D+K[.4] ; INIT ADR OF IB DATA
3440 RC[OE] K[.8] ; INIT EXP DATA
3441 RC[0]_K[.1] ; INIT DATA TO SHIFT
3442
3443 ///////////////////////////////////////////////////////////////////
3444 +
3445 .START THE TEST
3446 -
3447
3448 T137S1: RC[OC]_K[.4] ; SET THE LOOP COUNT
3449 =0 ERLOOP
3450 NOP
3451 =0
3452 T137L1: ALU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
3453 D RC[OE] ; GET EXPECTED DATA
3454 =0 CALL,J/DISPAT ; LOAD THE CONSTANT LATCH
3455 SYNCOC: ALU_R[0],SHF/ALU.DT,DT/INST.DEP,OK/SHF ; EXECUTE THE SHIFT
3456 ALU_Q-D,CLK.UBCC ; CHECK THE SHIFTED DATA
3457 Z? ; BRANCH IF OK
3458 =0 ERROR2,RC[OD]_Q
3459 LAB R[1]
3460 R[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
3461 D_RC[OE]
3462 D-D.RIGHT
3463 RC[OE]_D ; GEN NEW EXP DATA

```

U 1126, 0018,0039,0D80,09F8,0000,115B
U 1127, 0818,0038,3580,0800,0000,13D6
U 13D6, 0019,0014,1180,0A88,0000,13D7
U 13D7, 0018,0038,0180,09F0,0000,13D8
U 13D8, 0018,0038,0580,0A80,0000,13D9

U 13D9, 0018,0038,1180,09E0,0000,1128
U 1128, 0000,003D,0180,0800,0000,116F
U 1129, 0000,003C,0180,0800,0000,112A

U 112A, 2000,003D,0180,0A08,4200,1194
U 112B, 0810,0038,0180,0970,0000,112C
U 112C, 0000,003D,0180,0800,0000,118E
U 112D, 0060,C03C,01C0,0A00,0000,13DA
U 13DA, 001D,2000,0180,0800,0010,13DB
U 13DB, 0000,013C,0180,0800,0000,112E
U 112E, 0001,203D,0180,09E8,0000,1172
U 112F, 0000,003C,0180,0A08,0000,13DC
U 13DC, 0018,0014,0980,0A88,0000,13DD
U 13DD, 0810,0038,0180,0970,0000,13DE
U 13DE, 0600,003C,0180,0800,0000,13DF
U 13DF, 0001,003C,0180,09F0,0000,13E0

```

U 13E0, 0810,0038,0180,0960,0000,13E1 :3464 D RC[0C]
U 13E1, 0019,8000,0580,09E0,0010,13E2 :3465 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 13E2, 0000,013C,0180,0800,0000,1130 :3466 Z?
U 1130, 0000,003C,0180,0800,0000,112A :3467 =0 J/T137L1
U 1131, 0000,003C,0180,0800,0000,1132 :3468 NOP
:3469
:3470 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3471 :X 54
:3472 :$ 507D,50D0,50B0,5090
:3473
:3474

```

; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:

54
507D, 50D0, 50B0, 5090

ZZ
ES

00000000000000000000

22

222

```

:3475 .PAGE 'TEST 138 COMPATABILITY MODE CONTEXT LATCH'
:3476 *****
:3477 ++
:3478 TEST 138 COMPATABILITY MODE CONTEXT LATCH
:3479
:3480 TEST DESCRIPTION
:3481 THIS TEST CHECKS BYTE AND WORD CONTEXT BY LOADING THE IB WITH
:3482 THE APPROPRIATE OPCODE, DOING A SIGN EXTEND THRU THE AMX WITH
:3483 INSTRUCTION DEPENDENT DATA TYPE, AND CHECKING THAT THE CONTEXT
:3484 WAS RECEIVED CORRECTLY BY CHECKING THE SIGN EXTENDED DATA.
:3485
:3486 SUBTST 1 - CHECK BYTE CONTEXT
:3487 SUBTST 2 - CHECK WORD CONTEXT
:3488
:3489 LOGIC DESCRIPTION
:3490 THIS TEST CHECKS THE CONTEXT MULTIPLEXOR OF THE IRC MODULE.
:3491
:3492 ERROR DESCRIPTION
:3493 DATA: EXPECTED SIGN EXTENDED DATA
:3494 RECEIVED SIGN EXTENDED DATA
:3495
:3496 SYNC POINT DESCRIPTION
:3497 ADDRESS SYNC00--CONTEXT IS LATCHED AT THE INSTRUCTION AFTER
:3498 THIS ONE.
:3499
:3500 *****
:3501 =0
:3502 T138: NEWTST[.2]
:3503 R[1]_K[.60] ; SET ADR OF IB DATA
:3504 R[0]_K[.FF00] ; INIT AMX DATA
:3505
:3506 ///////////////////////////////////////////////////
:3507 +
:3508 FIRST CHECK BYTE CONTEXT
:3509 -
:3510
:3511 =0
:3512 T138S1: SUBTEST
:3513 RC[0E]_0 ; INIT EXPECTED AMUX DATA
:3514 =0 ERLOOP
:3515 NOP
:3516 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:3517 NOP
:3518 =0 CALL,J/SETCM ; SET THE CM BIT
:3519 D_0
:3520 =0 CALL,J/DISPAT ; LATCH THE CONTEXT
:3521 Q_R[0] ; PUT AMX DATA IN Q
:3522 Q-Q.SXT[INST.DEP] ; CHECK THE CONTEXT
:3523 A[U-Q-D,CLK.UBCC] ; CHECK RESULT
:3524 Z?
:3525 =0 ERROR1,RC[0D]_Q ; CONTEXT INCORRECT
:3526
:3527
:3528 ///////////////////////////////////////////////////
:3529 +
```

U 1132, 0018,0039,0980,09F8,0000,115B
U 1133, 0018,0038,A580,0A88,0000,13E3
U 13E3, 0018,0038,4D80,0A80,0000,1134

U 1134, 0000,003D,0180,0800,0000,1189
U 1135, 0003,003C,0180,09F0,0000,1136
U 1136, 0000,003D,0180,0800,0000,116F
U 1137, 0000,003C,0180,0800,0000,1138
U 1138, 2000,003D,0180,0A08,4200,1194
U 1139, 0000,003C,0180,0800,0000,113A
U 113A, 0000,003D,0180,0800,0000,118F
U 113B, 0F00,003C,0180,0800,0000,113C
U 113C, 0000,003D,0180,0800,0000,118E
U 113D, 0000,003C,01C0,0A00,0000,13E4
U 13E4, 0002,E03C,01C0,0800,0000,13E5
U 13E5, 001D,2000,0180,0800,0010,13E6
U 13E6, 0000,013C,0180,0800,0000,113E
U 113E, 0001,203D,0180,09E8,0000,1170

```

:3530 ; NOW CHECK WORD CONTEXT
:3531 ; -
:3532
U 113F, 0000,003C,0180,0A08,0000,1140 :3533 T138S2: LAB R[1]
U 1140, 0000,003D,0180,0800,0000,1189 :3534 =0 SUBTEST
U 1141, 0018,0014,0980,0A88,0000,13E7 :3535 R[1],LA+K[.2] ; INCREMENT ADR OF IB DATA
U 13E7, 0818,0038,0180,0800,0000,13E8 :3536 D_K[FFFF] ; GEN AMX DATA
U 13E8, 0800,003C,0180,0800,0000,13E9 :3537 D-D,SWAP
U 13E9, 0001,003C,0180,0A80,0000,1142 :3538 R[0] D ; SAVE
U 1142, 0000,003D,0180,0800,0000,116F :3539 =0 ERLOOP
U 1143, 0000,003C,0180,0800,0000,1144 :3540 NOP
U 1144, 2000,003D,0180,0A08,4200,1194 :3541 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1145, 0000,003C,0180,0800,0000,1146 :3542 NOP
U 1146, 0000,003D,0180,0800,0000,118F :3543 =0 CALL,J/SETCM ; SET THE CM BIT
U 1147, 0F00,003C,0180,0800,0000,1148 :3544 D 0
U 1148, 0000,003D,0180,0800,0000,118E :3545 =0 CALL,J/DISPAT ; LATCH THE CONTEXT
U 1149, 0000,003C,01C0,0A00,0000,13EA :3546 Q_R[0] ; PUT AMX DATA IN Q
U 13EA, 0002,E03C,01C0,0800,0000,13EB :3547 Q-Q,SXT[INST.DEP] ; CHECK THE CONTEXT
U 13EB, 001D,2000,0180,0800,0010,13EC :3548 A[U-Q-D,CLK.UBCC] ; CHECK RESULT
U 13EC, 0000,013C,0180,0800,0000,114A :3549 Z?
U 114A, 0001,203D,0180,09E8,0000,1170 :3550 =0 ERROR1,R[0D],Q ; CONTEXT INCORRECT
U 114B, 0000,003C,0180,0800,0000,114C :3551 NOP
:3552
:3553
:3554 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3555 ; X 60
:3556 ; SUBTEST 1
:3557 ; $ C514
:3558 ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3559 ; 142424
:3560
:3561 ; SUBTEST 2
:3562 ; $ 4500
:3563 ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
:3564 ; 042400
:3565
:3566 =0
U 114C, 0000,003D,0180,0800,0000,115B :3567 T139: NEWTST
U 114D, 0000,003C,0180,0800,0000,114E :3568 NOP
:3569 =0
U 114E, 0000,003D,0180,0800,0000,115B :3570 T13A: NEWTST
U 114F, 0000,003C,0180,0800,0000,1150 :3571 NOP
:3572 =0
U 1150, 0000,003D,0180,0800,0000,115B :3573 T13B: NEWTST
U 1151, 0000,003C,0180,0800,0000,1152 :3574 NOP
:3575 =0
U 1152, 0000,003D,0180,0800,0000,115B :3576 T13C: NEWTST
U 1153, 0000,003C,0180,0800,0000,13ED :3577 NOP
U 13ED, 0000,003D,0180,0800,0000,115B :3578 ENDTST: NEWTST
:3579

```


:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2351=	2352=	2353=	2354=	2363=	2364=	2365=	2366=
U 1010	2367=	2368=	2376=	2377=	2385=	2386=	2387=	2388=
U 1018	2403=	2409=	2411=	2412=	2414=	2421=	2422=	2423=
U 1020	2424=	2425=	2431=	2432=	2435=	2442=	2443=	2444=
U 1028	2445=	2446=	2447=	2448=	2457=	2464=	2466=	2467=
U 1030	2468=	2469=	2470=	2471=	2472=	2473=	2478=	2479=
U 1038	2482=	2489=	2491=	2492=	2493=	2494=	2495=	2496=
U 1040	2503=	2510=	2512=	2513=	2514=	2515=	2516=	2517=
U 1048	2526=	2533=	2534=	2535=	2536=	2537=	1920:	1846
U 1050	2546=	2553=	2555=	2556=	2557=	2558=	2559=	2560=
U 1058	2569=	2570=	1924:	1869	2603=	2604=	1928:	1870
U 1060	2613=	2614=	2615=	2616=	2617=	2618=	2621=	2622=
U 1068	2630=	2631=	2670=	2671=	2679=	2680=	2681=	2682=
U 1070	2683=	2684=	2685=	2686=	2690=	2691=	2696=	2697=
U 1078	2700=	2708=	2709=	2710=	2711=	2712=	2713=	2714=
U 1080	2715=	2716=	2717=	2718=	2721=	2722=	2727=	2728=
U 1088	2731=	2732=	2808=	2809=	2823=	2824=	2825=	2826=
U 1090	2832=	2833=	2840=	2841=	2908=	2909=	2941=	2942=
U 1098	2943=	2944=	2945=	2946=	2949=	2950=	2954=	2960=
U 10A0	2968=	2975=	2976=	2977=	2980=	2981=	2982=	2983=
U 10A8	2988=	2994=	3000=	3001=	3010=	3018=	3020=	3021=
U 10B0	3024=	3025=	3026=	3027=	3032=	3033=	3037=	3038=
U 10B8	3044=	3050=	3055=	3063=	3065=	3066=	3070=	3071=
U 10C0	3072=	3073=	3074=	3075=	3079=	3080=	3084=	3090=
U 10C8	3098=	3106=	3109=	3110=	3117=	3118=	3119=	3120=
U 10D0	3121=	3122=	3128=	3129=	3135=	3141=	3149=	3150=
U 10D8	3153=	3160=	3163=	3164=	3171=	3172=	3173=	3174=
U 10E0	3179=	3180=	3186=	3192=	3200=	3201=	3204=	3211=
U 10E8	3212=	3213=	3214=	3215=	3216=	3217=	3218=	3219=
U 10F0	3223=	3229=	3237=	3244=	3245=	3246=	3247=	3248=
U 10F8	3249=	3250=	3251=	3252=	3256=	3262=	3270=	3277=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1871	3279=	3280=	1840:	1841:	1842:	1843:
U 1110	3282=	3283=	3284=	3285=	3286=	3287=	3288=	3289=
U 1118	3293=	3299=	3309=	3310=	3374=	3375=	3385=	3386=
U 1120	3387=	3388=	3394=	3395=	3401=	3402=	3437=	3438=
U 1128	3449=	3450=	3452=	3453=	3454=	3455=	3458=	3459=
U 1130	3467=	3468=	3502=	3503=	3512=	3513=	3514=	3515=
U 1138	3516=	3517=	3518=	3519=	3520=	3521=	3525=	3533=
U 1140	3534=	3535=	3539=	3540=	3541=	3542=	3543=	3544=
U 1148	3545=	3546=	3550=	3551=	3567=	3568=	3570=	3571=
U 1150	3573=	3574=	3576=	3577=	1872	2012:	1873	1874
U 1158	1875	1882	1883	1897	1898	1899	1900	1901
U 1160	1902	1903	1904	1905	1906	1907	1908	1909
U 1168	1910	1911	1912	1913	1914	1915	1916	1917
U 1170	1918	1919	1922	1923	1966	1967	1968	1969
U 1178	1970	1971	1972	1973	1974	1975	1976	1977
U 1180	1978	1979	1980	1981	1983	1984	1985	1986
U 1188	1988	1998	1999	2007	2008	2009	2023	2286
U 1190	2287	2288	2289	2290	2301	2302	2303	2304
U 1198	2305	2306	2307	2355	2369	2370	2371	2372

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2373	2374	2375	2389	2390	2391	2392	2393
U 11A8	2394	2395	2396	2397	2398	2399	2400	2401
U 11B0	2402	2410	2413	2426	2427	2428	2429	2430
U 11B8	2433	2434	2449	2450	2451	2452	2453	2454
U 11C0	2455	2456	2465	2474	2475	2476	2477	2480
U 11C8	2481	2490	2497	2498	2499	2500	2501	2502
U 11D0	2511	2518	2519	2520	2521	2522	2523	2524
U 11D8	2525	2538	2539	2540	2541	2542	2543	2544
U 11E0	2545	2554	2561	2562	2563	2564	2565	2566
U 11E8	2567	2568	2605	2612	2619	2620	2623	2624
U 11F0	2625	2626	2627	2628	2629	2678	2687	2688
U 11F8	2689	2692	2693	2694	2695	2698	2699	2719
U 1200	2028:	2029:	2030:	2031:	2032:	2033:	2034:	2035:
U 1208	2036:	2037:	2038:	2039:	2040:	2041:	2042:	2043:
U 1210	2044:	2045:	2046:	2047:	2048:	2049:	2050:	2051:
U 1218	2052:	2053:	2054:	2055:	2056:	2057:	2058:	2059:
U 1220	2060:	2061:	2062:	2063:	2064:	2065:	2066:	2067:
U 1228	2068:	2069:	2070:	2071:	2072:	2073:	2074:	2075:
U 1230	2076:	2077:	2078:	2079:	2080:	2081:	2082:	2083:
U 1238	2084:	2085:	2086:	2087:	2088:	2089:	2090:	2091:
U 1240	2092:	2093:	2094:	2095:	2096:	2097:	2098:	2099:
U 1248	2100:	2101:	2102:	2103:	2104:	2105:	2106:	2107:
U 1250	2108:	2109:	2110:	2111:	2112:	2113:	2114:	2115:
U 1258	2116:	2117:	2118:	2119:	2120:	2121:	2122:	2123:
U 1260	2124:	2125:	2126:	2127:	2128:	2129:	2130:	2131:
U 1268	2132:	2133:	2134:	2135:	2136:	2137:	2138:	2139:
U 1270	2140:	2141:	2142:	2143:	2144:	2145:	2146:	2147:
U 1278	2148:	2149:	2150:	2151:	2152:	2153:	2154:	2155:
U 1280	2156:	2157:	2158:	2159:	2160:	2161:	2162:	2163:
U 1288	2164:	2165:	2166:	2167:	2168:	2169:	2170:	2171:
U 1290	2172:	2173:	2174:	2175:	2176:	2177:	2178:	2179:
U 1298	2180:	2181:	2182:	2183:	2184:	2185:	2186:	2187:
U 12A0	2188:	2189:	2190:	2191:	2192:	2193:	2194:	2195:
U 12A8	2196:	2197:	2198:	2199:	2200:	2201:	2202:	2203:
U 12B0	2204:	2205:	2206:	2207:	2208:	2209:	2210:	2211:
U 12B8	2212:	2213:	2214:	2215:	2216:	2217:	2218:	2219:
U 12C0	2220:	2221:	2222:	2223:	2224:	2225:	2226:	2227:
U 12C8	2228:	2229:	2230:	2231:	2232:	2233:	2234:	2235:
U 12D0	2236:	2237:	2238:	2239:	2240:	2241:	2242:	2243:
U 12D8	2244:	2245:	2246:	2247:	2248:	2249:	2250:	2251:
U 12E0	2252:	2253:	2254:	2255:	2256:	2257:	2258:	2259:
U 12E8	2260:	2261:	2262:	2263:	2264:	2265:	2266:	2267:
U 12F0	2268:	2269:	2270:	2271:	2272:	2273:	2274:	2275:
U 12F8	2276:	2277:	2278:	2279:	2280:	2281:	2282:	2283:
U 1300	2720	2723	2724	2725	2726	2729	2730	2810
U 1308	2811	2818	2819	2820	2821	2822	2827	2828
U 1310	2829	2830	2831	2834	2835	2836	2837	2838
U 1318	2839	2910	2911	2912	2913	2914	2915	2916
U 1320	2917	2918	2919	2920	2921	2922	2923	2924
U 1328	2925	2926	2927	2928	2929	2930	2931	2932
U 1330	2933	2940	2947	2948	2951	2952	2953	2961
U 1338	2962	2963	2964	2965	2966	2967	2978	2979
U 1340	2984	2985	2986	2987	2995	2996	2997	2998

[illegible]

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2999	3002	3003	3004	3005	3006	3007	3008
U 1350	3009	3019	3022	3023	3028	3029	3030	3031
U 1358	3034	3035	3036	3039	3040	3041	3042	3043
U 1360	3051	3052	3053	3054	3064	3067	3068	3076
U 1368	3077	3078	3081	3082	3083	3091	3092	3093
U 1370	3094	3095	3096	3097	3107	3108	3111	3113
U 1378	3114	3115	3116	3123	3124	3125	3126	3127
U 1380	3130	3131	3132	3133	3134	3142	3143	3144
U 1388	3145	3146	3147	3148	3151	3152	3161	3162
U 1390	3165	3167	3168	3169	3170	3175	3176	3177
U 1398	3178	3181	3182	3183	3184	3185	3193	3194
U 13A0	3195	3196	3197	3198	3199	3202	3203	3220
U 13A8	3221	3222	3230	3231	3232	3233	3234	3235
U 13B0	3236	3253	3254	3255	3263	3264	3265	3266
U 13B8	3267	3268	3269	3278	3281	3290	3291	3292
U 13C0	3300	3301	3302	3303	3304	3305	3306	3307
U 13C8	3308	3376	3377	3384	3389	3390	3391	3392
U 13D0	3393	3396	3397	3398	3399	3400	3439	3440
U 13D8	3441	3448	3456	3457	3460	3461	3462	3463
U 13E0	3464	3465	3466	3504	3522	3523	3524	3536
U 13E8	3537	3538	3547	3548	3549	3578		
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F6	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

ZZ-ESKAH-V132 Line Number Index
ESKAH37.MCR

MICRO2 1M(01)

16-DEC-82 12:20:29

B 15

SEQ 1003
Page 9

Words not
in bounds

ESK00DEF
ESK00MAC
ESKAHMAC
ESKAH37

0
0
0
1022

Used 1022
Remaining

Total microwords used in memory U: 1022
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

ZZ-ESKAH-V132 Line Number Index
ESKAH37.MCR

MICRO2 1M(01)

16-DEC-82 12:20:29

C 15

SEQ 1004
Page 9

; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH37.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

CCCCCCCCCCCCCCCC

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2132	TEST 13D DATA PATH CONTEXT LATCH
: 2208	TEST 13E SIGN OF SOURCE DEPENDENT ON IR<1>
: 2291	TEST 13F INSTRUCTION DEPENDENT ALU ROM
: 2598	TEST 140 COND CODE LOAD = 1,2,4, 3 & 5 & 6 (C & V BIT ONLY)
: 2819	TEST 141 CONDITION CODE LOAD = 3 (N AND Z BIT)
: 2979	TEST 142 CONDITION CODE LOAD = 5 & 6 (N AND Z BIT)
: 3200	TEST 143 INSTRUCTION DEPENDENT COND CODE LOAD (C BIT)
: 3448	TEST 144 INSTRUCTION DEPENDENT COND CODE LOAD (V BIT)


```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
:1825
:1826
:1827
:1828
:1829
:1830
U 1100, 0000,003C,19C0,0A78,0084,7001
U 1101, 0000,003C,05C0,0A78,0084,7001
U 1102, 0000,003C,09C0,0A78,0084,7001
U 1103, 0000,003C,0DC0,0A78,0084,7001
U 1104, 0000,003C,11C0,0A78,0084,7001
U 1105, 0000,003C,D5C0,0A78,0084,7001
U 1106, 0000,003C,D9C0,0A78,0084,7001
U 1107, 0000,003C,5DC0,0A78,0084,7001
U 1108, 0000,003C,01C0,0A78,0084,7001
U 110C, 0000,003C,85C0,0A78,0084,7001
U 110D, 0000,003C,89C0,0A78,0084,7001
U 110E, 0000,003C,65C0,0A78,0084,7001
U 110F, 0000,003C,61C0,0A78,0084,7154
:1844
U 1001, 0001,2024,0180,0800,0010,1026
U 1026, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000

```

```

:1806 .REGION/1000,13FF
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
:1825
:1826
:1827
:1828
:1829
:1830

```

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
 EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

```

1100: SC_K[ZERO],Q_R[OF],J/TRPH0      ; SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0      ; DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0      ; X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0      ; TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0      ; TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0      ; TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0      ; RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0      ; TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0      ; CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0      ; RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0      ; TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0     ; ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2      ; CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC    ; WAS TRAP EXPECTED?
      Z?                               ; BRANCH IF NO
=0    ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN

```

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER

```



```

:1861
:1862
:1863
:1864
:1865
U 1003, 0018,0038,1D80,09E8,0000,1004 :1866
U 1004, 0000,003D,D980,0800,0084,71C1 :1867
U 1005, 0000,003C,49F0,2C00,0000,102E :1868
U 102E, 0001,203C,4DF0,2DB0,0000,1036 :1869
U 1036, 0001,203C,65F0,2DB8,0000,103E :1870
U 103E, 0001,203C,6DF0,2DD8,0000,104F :1871
U 104F, 0001,203C,75F0,2DE0,0000,105B :1872
U 105B, 0001,203C,79F0,2DC8,0000,105F :1873
U 105F, 0001,203C,69F0,2DC0,0000,1109 :1874
U 1109, 0001,203C,81F0,2DD0,0000,1000 :1875
U 1000, 0001,203D,0180,09F0,0000,11A6 :1876
:1877
:1878
:1879
:1880
:1881
U 1154, 0001,2024,0180,0800,0010,1190 :1882
U 1190, 0000,013C,0180,0800,0000,1006 :1883
U 1006, 0001,2036,0180,0AF8,0000,0001 :1884
U 1007, 0000,003C,0180,0800,0000,1003 :1885
:1886
:1887
:1888
:1889
:1890
:1891
:1892
:1893
:1894
:1895
:1896
U 1191, 0000,003C,65F8,0800,0084,7192 :1897
U 1192, 0818,0038,8D80,0800,0000,1193 :1898
U 1193, 0D00,003C,0180,0800,0000,1194 :1899
U 1194, 0000,003C,3D80,3C00,0000,1195 :1900
U 1195, 0818,0038,0580,0800,0000,1196 :1901
U 1196, 0D00,003C,0180,0800,0000,1197 :1902
U 1197, 0F00,003C,3180,3C00,0000,1198 :1903
U 1198, 0000,003C,5D80,3C00,0000,1199 :1904
U 1199, 0000,003C,3980,3C00,0000,119A :1905
U 119A, 0000,003C,2980,3C00,0000,119B :1906
U 119B, 0000,003C,4980,3C00,0000,119C :1907
U 119C, 0000,003C,7180,3C00,0000,119D :1908
U 119D, 0818,0038,C180,0800,0000,119E :1909
U 119E, 0000,003C,6580,3C00,0000,119F :1910
U 119F, 0F00,003C,6D80,3C00,0000,11A0 :1911
U 11A0, 0000,003C,6D80,3C00,0000,11A1 :1912
U 11A1, 0000,003C,6580,3C00,0000,11A2 :1913
U 11A2, 0003,003C,0180,09F0,0000,11A3 :1914
U 11A3, 0003,003C,0180,0AF8,0000,11A4 :1915

```

```

:
:      CACHE PARITY REGISTER
:      TB ERROR REGISTER 1
:      TB ERROR REGISTER 0
:-

```

```

TRPH1: RC[0D] SC
=0     SETRCF[.9]
      Q_ID[TBER0]
      RC[6]-Q,Q_ID[TBER1]
      RC[7]-Q,Q_ID[SBI.ERR]
      RC[0B]-Q,Q_ID[FAULT]
      RC[0C]-Q,Q_ID[MAINT]
      RC[9]-Q,Q_ID[PARITY]
      RC[8]-Q,Q_ID[TIME.ADDR]
      RC[0A]-Q,Q_ID[USTACK]
1000:  RC[0E]-Q,ERROR1

```

```

: +
: THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
:-

```

```

TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
      Z?                               ; BRANCH IF NO
=0     ALU_Q[AND]MASK,RC[0F]_ALU,RETURN1 ; RETURN
      J/TRPH1                          ; REPORT UNEXPECTED TRAP

```

```

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
:
:      NEWTST
:      ERLOOP
:      ERROR1
:      ERROR2
:

```

```

SCOPE: SC_K[.10],Q_0      ; SETUP TO WRITE IPL OF 1F
      D_K[.1F]            ; ...
      D-DAL.SC
      ID[PSL]_D           ; WRITE THE PSL
      D_K[.1]            ; SETUP TO CLEAR THE CES REGISTER
      D-DAL.SC
      ID[CES]_D,D_0       ; CLEAR THE CES REGISTER
      ID[ACC.TS]_D        ; SHUT OFF THE FLOATING POINT
      ID[SIR]_D           ; CLEAR THE SIR REGISTER
      ID[CLK.TS]_D        ; STOP INTERVAL TIMER
      ID[TBER0]_D         ; SHUT OFF THE TB
      ID[COMP]_D          ; CLEAR SILO COMPARATOR
      D_K[.FFFF]
      ID[SBI.ERR]_D
      ID[FAULT]_D,D_0
      ID[FAULT]_D
      ID[SBI.ERR]_D
      RC[0E]_0
      RC[0F]_0

```

```

U 11A4, 0003,003C,0180,09E8,0000,105E :1916
U 11A5, 0818,0038,0980,0800,0000,105E :1917
U 11A6, 0810,0038,0180,0978,0000,11A7 :1918
U 11A7, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 11A8, 0810,0038,0180,0978,0000,11A9 :1922
U 11A9, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
U 105E, 0000,003C,1D80,3C00,0000,105E :1927
:1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,11AA :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 11AA, 0018,0038,1980,0800,0000,11BA :1966
U 11AB, 0018,0038,1980,0800,0000,11BB :1967
U 11AC, 0018,0038,1980,0800,0000,11BC :1968
U 11AD, 0018,0038,1980,0800,0000,11BD :1969
U 11AE, 0018,0038,0980,0800,0000,11BA :1970

```

```

RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[0F]
: D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
: D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
: D_TXDB,D,J/CALLCON ; CALL THE CONSOLE
:
: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
: -
13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
:
: +
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
:
: FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
: THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
:
: =0 D 0,CALL,J/DC5
: NOP
: =0 CALL,J/DC5
: -
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```

```

U 11AF, 0018,0038,0980,0800,0000,11BB :1971
U 11B0, 0018,0038,0980,0800,0000,11BC :1972
U 11B1, 0018,0038,0980,0800,0000,11BD :1973
U 11B2, 0018,0038,0580,0800,0000,11BA :1974
U 11B3, 0018,0038,0580,0800,0000,11BB :1975
U 11B4, 0018,0038,0580,0800,0000,11BC :1976
U 11B5, 0018,0038,0580,0800,0000,11BD :1977
U 11B6, 0018,0038,C180,0800,0000,11BA :1978
U 11B7, 0018,0038,C180,0800,0000,11BB :1979
U 11B8, 0018,0038,C180,0800,0000,11BC :1980
U 11B9, 0018,0038,C180,0800,0000,11BD :1981
:1982
U 11BA, 0118,0038,1B80,0800,0000,11BE :1983
U 11BB, 0118,0038,0B80,0800,0000,11BE :1984
U 11BC, 0118,0038,0780,0800,0000,11BE :1985
U 11BD, 0118,0038,C380,0800,0000,11BE :1986
:1987
U 11BE, 0100,003E,0380,0800,0000,0001 :1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
U 11BF, 0810,0038,4D80,0978,0000,11C0 :1998
U 11C0, 0019,4016,4D80,09F8,0000,0001 :1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
U 11C1, 0010,0038,01C0,0978,0000,11C2 :2007
U 11C2, 0019,2034,4DC0,0800,0000,11C3 :2008
U 11C3, 0019,2032,1D80,09F8,0000,0001 :2009
:2010

```

```

DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_0(K),D,D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D,D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D,D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D,D.LEFT2,SI/7,J/SX

SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT

```

```

;+
; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
; TYPING IT.
;-

```

```

SUBTST: D_RC[0F],KMX/.FF00
RC[0F],D+K[.FF00],WORD,RETURN1

```

```

;+
; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
;-

```

```

SETRCF: Q_RC[0F]
Q-Q.AND.K[.FF00]
RC[0F],Q.OR.SC,RETURN1

```

```

:2011
U 1155, 0019,2000,05C0,0800,0000,12AB :2012
:2013
:2014
:2015
:2016
:2017
U 11C4, 0038,003B,41C0,0800,0000,1200 :2018
:2019
:2020
U 1200, 0000,003E,0180,0800,0000,0001 :2021
U 1202, 0000,003E,0180,0800,0000,0001 :2022
U 1204, 0000,003E,0180,0800,0000,0001 :2023
U 1206, 0000,003E,0180,0800,0000,0001 :2024
U 1208, 0000,003E,0180,0800,0000,0001 :2025
U 128F, 0000,003E,0180,0800,0000,0001 :2026
U 12C4, 0000,003E,0180,0800,0000,0001 :2027
U 12AA, 0000,003C,0180,0800,0000,1010 :2028
:2029
:2030
:2031
:2032
:2033
:2034
:2035
:2036
:2037
:2038
U 1010, 0000,003E,01F8,0800,0000,0001 :2039
U 1011, 0018,003A,05C0,0800,0000,0001 :2040
U 1012, 0018,003A,09C0,0800,0000,0001 :2041
U 1013, 0018,003A,0DC0,0800,0000,0001 :2042
U 1014, 0018,003A,11C0,0800,0000,0001 :2043
U 1015, 0018,0038,11C0,0800,0000,11C5 :2044
U 1016, 0018,003A,D5C0,0800,0000,0001 :2045
U 1017, 0018,003A,5DC0,0800,0000,0001 :2046
U 11C5, 0019,2016,05C0,0800,0000,0001 :2047
:2048
:2049
:2050
:2051
:2052
:2053
:2054
:2055
:2056
:2057
:2058
:2059
:2060
:2061
:2062
U 11C6, 0000,003C,0180,0A10,0200,11C7 :2063
U 11C7, 0000,003C,0180,C800,0000,11C8 :2064
U 11C8, 0001,003C,0180,0A80,0000,11C9 :2065

```

1155: Q_Q-K[.1],J/12AB

:+ THIS INSTRUCTION EXECUTES THE SUB/SPEC FUNCTION WHICH IS USED TO
: LATCH THE DATA TYPE IN THE INSTRUCTION BUFFER.
:-

DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/1200

```

1200: RETURN1 ; MOVB S^#,S^#
1202: RETURN1
1204: RETURN1 ; MOVB R0,X
1206: RETURN1 ; MOVQ R0,R0
1208: RETURN1 ; MOVX (R0),XX
128F: RETURN1 ; HALT
12C4: RETURN1 ; MOVB R0,R0
12AA: NOP ; ECO'D LOCATION

```

:+ THIS SUBROUTINE IS USED BY THE BRANCH TESTS. IT PUTS A NUMBER IN THE
: Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT WERE ASSERTED. IT MUST
: BE CALLED WITH A SUBROUTINE CALL AND THE BRANCH ENABLED.
:-

```

=000
IBBRTABLE:
Q_0, RETURN1
Q_K[.1], RETURN1
Q_K[.2], RETURN1
Q_K[.3], RETURN1
REIENT: Q_K[.4], RETURN1
Q_K[.4], J/ADDONE
Q_K[.6], RETURN1
Q_K[.7], RETURN1
ADDONE: Q_Q+K[.1], RETURN1

```

:+ THIS ROUTINE IS USED TO FETCH THE AMX, BMX, AND EXPECTED DATA FROM THE
: CACHE, LOAD THE INSTRUCTION BUFFER, AND EXECUTE A SUB/SPEC TO LATCH THE
: DATA TYPE IN THE INSTRUCTION BUFFER.

IT MUST BE CALLED WITH THE ADDRESS OF THE AMX DATA IN RA[2], THE ADDRESS
OF THE BMX DATA IN RA[3], THE ADDRESS OF THE EXPECTED DATA IN RA[4], AND
THE ADDRESS OF THE INSTRUCTION BUFFER DATA IN RA[1]. IT RETURNS WITH
THE AMX DATA IN R[0], THE BMX DATA IN R[0], AND THE EXPECTED DATA
IN R[0E].

```

GETDATA:
VA R[2] ; LOAD ADR OF AMX DATA
D[CONG]_CACHE.P ; FETCH
R[0]_D ; SAVE

```


U 11C9, 0000,003C,0180,0A18,0200,11CA :2066
U 11CA, 0000,003C,0180,C800,0000,11CB :2067
U 11CB, 0001,003C,0180,0980,0000,11CC :2068
U 11CC, 0000,003C,0180,0A20,0200,11CD :2069
U 11CD, 0000,803C,0180,C800,0000,11CE :2070
U 11CE, 0019,0034,4980,09F0,0000,110B :2071
U 110B, 2000,003D,0180,0A08,4200,11DF :2072
U 1109, 0000,003C,0180,0800,0000,11C4 :2073

VA R[3] : LOAD ADR OF BMX DATA
D[ONG]_CACHE.P : FETCH
RC[0] D : SAVE
VA R[4] : LOAD ADR OF EXP DATA
D[BYTE]_CACHE.P : FETCH
RC[OE] D.AND.K[.FF] : SAVE
=0 ALU R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
J/DISPAT : EXECUTE THE CALL 3 AND RETURN

:+ THIS SUBROUTINE LOADS THE V BIT, IN THE PSL, WITH THE COMPLIMENT OF THE
V BIT IN RC[OE], AND RETURNS.
:-

INITVBIT:

U 11CF, 0813,001C,0180,0970,0000,11D0 :2082
U 11D0, 0819,0034,0980,0800,0000,11D1 :2083
U 11D1, 0000,003C,3DF0,2C00,0000,11D2 :2084
U 11D2, 0019,2024,09C0,0800,0000,11D3 :2085
U 11D3, 081D,0030,0180,0800,0000,11D4 :2086
U 11D4, 0000,003C,3D80,3E00,0000,11D5 :2087
U 11D5, 0810,0038,0180,0970,0000,11D6 :2088
U 11D6, 0000,003E,0180,0900,0000,0001 :2089

D_NOT.RC[OE] : GET COMPLIMENT EXP DATA
D_D.AND.K[.2] : MASK
Q_ID[PSL] : READ THE PSL
Q_Q.ANDNOT.K[.2] : MASK THE V BIT
D_D.OR.Q : INSERT COMP OF EXP V BIT
ID[PSL] D,LAB_R[0] : LOAD THE V BIT
D_RC[OE] : GET EXPECTED DATA
LC_RC[0],RETURN1 : LATCH BMX DATA

:+ THIS ROUTINE LOADS THE N BIT, IN THE PSL, WITH THE COMPLIMENT OF THE
N BIT IN RC[OE], AND RETURNS.
:-

INITNBIT:

U 11D7, 0813,001C,0180,0970,0000,11D8 :2098
U 11D8, 0819,0034,0180,0800,0000,11D9 :2099
U 11D9, 0000,003C,3DF0,2C00,0000,11DA :2100
U 11DA, 0019,2024,01C0,0800,0000,11DB :2101
U 11DB, 081D,0030,0180,0800,0000,11DC :2102
U 11DC, 0000,003C,3D80,3E00,0000,11DD :2103
U 11DD, 0810,0038,0180,0970,0000,11DE :2104
U 11DE, 0000,003E,0180,0900,0000,0001 :2105

D_NOT.RC[OE] : GET COMPLIMENT EXP DATA
D_D.AND.K[.8] : MASK
Q_ID[PSL] : READ THE PSL
Q_Q.ANDNOT.K[.8] : MASK THE N BIT
D_D.OR.Q : INSERT COMP OF EXP N BIT
ID[PSL] D,LAB_R[0] : LOAD THE V BIT
D_RC[OE] : GET EXPECTED DATA
LC_RC[0],RETURN1 : LATCH BMX DATA

:+ THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
IS COMPLETELY FULL OF DATA.

:- BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.

IBWAIT: LOAD.IB,IBC/START
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ

U 11DF, 3000,003C,0180,6000,0000,11E0 :2116
U 11E0, 0000,003C,0180,F800,0000,11E1 :2117
U 11E1, 0000,003C,0180,F800,0000,11E2 :2118
U 11E2, 0000,003C,0180,F800,0000,11E3 :2119
U 11E3, 0000,003C,0180,F800,0000,11E4 :2120

U 11E4, 0000,003C,0180,F800,0000,11E5 :2121
U 11E5, 1000,003E,0180,F800,0000,0001 :2122
 :2123
 :2124
 :2125
U 11E6, 0000,003C,3DF0,2C00,0000,11E7 :2126
U 11E7, 0000,003C,8D80,0800,0084,71E8 :2127
U 11E8, 0803,001C,0180,0800,0000,11E9 :2128
U 11E9, 081D,0030,0180,0800,0000,11EA :2129
U 11EA, 0000,003E,3D80,3C00,0000,0001 :2130
 :2131

MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
:
: THIS ROUTINE IS USED TO SET THE COMPATABILITY MODE BIT IN THE PSL
:
SETCM: Q_ID[PSL]
 SC_K[.1F]
 D_NOT.MASK
 D_D.OR.Q
 ID[PSL]_D,RETURN1

```

:2132 .PAGE 'TEST 13D DATA PATH CONTEXT LATCH'
:2133 *****
:2134 ++
:2135 TEST 13D DATA PATH CONTEXT LATCH
:2136
:2137 TEST DESCRIPTION
:2138 THIS TEST CHECKS THE CONTEXT LATCH IN THE DATA PATH BY LOADING
:2139 THE IB WITH OPCODES OF DATA TYPE BYTE, WORD, AND LONG, DOING
:2140 AN AMX SIGN EXTEND FUNCTION, AND CHECKING THAT THE SIGN EXTEND
:2141 OCCURRED ON THE CORRECT BOUNDRY.
:2142
:2143 LOGIC DESCRIPTION
:2144 THIS TEST CHECKS THE CONTEXT LATCH AND THE CONTEXT GATES ON THE
:2145 DAP MODULE.
:2146
:2147 ERROR DESCRIPTION
:2148 DATA: EXPECTED SIGN EXTENDED DATA
:2149 RECEIVED SIGN EXTENDED DATA
:2150 LOOP COUNT -- INDICATES THE DATA TYPE CURRENTLY UNDER TEST,
:2151 I.E. 3=BYTE, 2=WORD, AND 1=LONG.
:2152
:2153 SYNC POINT DESCRIPTION
:2154 ADDRESS SYNCOD--AMX ENABLED FOR SIGN EXTEND
:2155 --
:2156 *****
:2157 =0
:2158 T13D: NEWTST[.3]
:2159 D K[.60]
:2160 R[1] D+K[.4] ; SET ADR OF IB DATA
:2161 D K[.8000]
:2162 KMX/.80
:2163 R[0] D+K[.80],D ALU ; INIT DATA TO SIGN EXTEND
:2164 Q D.SXT[BYTE],SC_K[.6] ; GEN EXP DATA FOR BYTE
:2165 R[SC] Q ; SAVE IN R6
:2166 Q D.SXT[WORD],SC_SC-K[.1] ; GEN EXP DATA FOR WORD
:2167 R[SC] Q ; SAVE IN R5
:2168 R[4] D ; AND LONG
:2169 SC_K[.6] ; INIT REGISTER ADDRESS
:2170
:2171 ///////////////////////////////////////////////////
:2172 +
:2173 START THE TEST
:2174 -
:2175
:2176 T13DS1: R[0C] K[.3] ; SET THE LOOP COUNT
:2177 T13DL1: D R[SC] ; GET EXP DATA
:2178 R[0E] D
:2179 =0 ERLOOP
:2180 D R[0E] ; GET EXP DATA
:2181 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2182 NOP
:2183 =0 CALL,J/DISPAT ; LOAD THE CONTEXT LATCH
:2184 Q R[0] ; GET DATA TO SIGN EXTEND
:2185 SYNCOD: Q-Q.SXT[INST.DEP] ; SIGN EXTEND ACCORDING TO DT
:2186 ACU Q-D,CLK.UBCC ; CHECK

```

```

U 100A, 0018,0039,0D80,09F8,0000,1191
U 100B, 0818,0038,A580,0800,0000,11EB
U 11EB, 0019,0014,1180,0A88,0000,11EC
U 11EC, 0818,0038,4580,0800,0000,11ED
U 11ED, 0000,003C,4180,0800,0000,11EE
U 11EE, 0819,0014,4180,0A80,0000,11EF
U 11EF, 0002,803C,D5C0,0800,0084,71F0
U 11F0, 0001,203C,0180,08E8,0000,11F1
U 11F1, 0002,403C,05C0,0800,0084,81F2
U 11F2, 0001,203C,0180,08E8,0000,11F3
U 11F3, 0001,003C,0180,0AA0,0000,11F4
U 11F4, 0000,003C,D580,0800,0084,71F5

```

```

U 11F5, 0018,0038,0D80,09E0,0000,11F6
U 11F6, 0800,003C,0180,0868,0000,11F7
U 11F7, 0001,003C,0180,09F0,0000,100C
U 100C, 0000,003D,0180,0800,0000,11A5
U 100D, 0810,0038,0180,0970,0000,1018
U 1018, 2000,003D,0180,0A08,4200,11DF
U 1019, 0000,003C,0180,0800,0000,101A
U 101A, 0000,003D,0180,0800,0000,11C4
U 101B, 0000,003C,01C0,0A00,0000,11F8
U 11F8, 0002,E03C,01C0,0800,0000,11F9
U 11F9, 001D,2000,0180,0800,0010,11FA

```

B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

```

U 11FA, 0000,013C,0180,0800,0000,101C :2187
U 101C, 0001,203D,0180,09E8,0000,11A8 :2188
U 101D, 0000,003C,0580,0800,0084,B1FB :2189
U 11FB, 0800,003C,0180,0A08,0000,11FC :2190
U 11FC, 0019,0014,1180,0A88,0000,11FD :2191
U 11FD, 0810,0038,0180,0960,0000,11FE :2192
U 11FE, 0019,8000,0580,09E0,0010,11FF :2193
U 11FF, 0000,013C,0180,0800,0000,1020 :2194
U 1020, 0000,003C,0180,0800,0000,11F6 :2195
U 1021, 0000,003C,0180,0800,0000,1022 :2196
                                     :2197
                                     :2198
                                     :2199
                                     :2200
                                     :2201
                                     :2202
                                     :2203
                                     :2204
                                     :2205
                                     :2206
                                     :2207

                                     Z?
                                     =0 ERROR2,RC[0D]_0
                                     SC SC-K[.1]
                                     D R[1]
                                     R[1] D+K[.4]
                                     D RC[0C]
                                     RC[0C]_D-K[.1],CLK.UBCC,BYTE
                                     Z?
                                     =0 J/T13DL1
                                     NOP

                                     ; THE FOLLOWING DATA IS THE IB DATA FOR THE ABOVE TEST:
                                     ;Z 64
                                     ; DATA TYPE BYTE
                                     ;$ 5090,0050
                                     ; DATA TYPE WORD
                                     ;$ 5080,0050
                                     ; DATA TYPE LONG
                                     ;$ 50D0,0050

```

```

; BRANCH IF OK
; SELECT NEXT EXP DATA
; INCREMENT ADR OF IB DATA
; DECREMENT LOOP COUNT

```

M
N
B
C
D
E
F
G
H
I
J
K
L
M
N
B
C
D
E
F
G
H
I
J
K
L


```

:2208 .PAGE "TEST 13E SIGN OF SOURCE DEPENDENT ON IR<1>"
:2209 *****
:2210 ++
:2211 TEST 13E SIGN OF SOURCE DEPENDENT ON IR<1>
:2212
:2213 TEST DESCRIPTION
:2214 THIS TEST CHECKS THAT THE SIGN OF THE SOURCE (SS) CLEARS WHEN
:2215 IR<1> IS CLEAR AND SETS WHEN IR<1> IS SET WHEN EXECUTING THE
:2216 FUNCTION SGN/ADD.SUB.
:2217
:2218 SUBTST 1 - CHECK WITH IR<1>=0
:2219 SUBTST 2 - CHECK WITH IR<1>=1
:2220
:2221 LOGIC DESCRIPTION
:2222 THIS TEST CHECKS ONE LEG OF THE SS MULTIPLEXOR ON THE DAP MODULE.
:2223
:2224 ERROR DESCRIPTION
:2225 DATA: LOOP COUNT -- INDICATES WHAT THE INITIAL VALUE OF THE SS IS,
:2226 I.E., 2=SS WAS 0, 1=SS WAS 1.
:2227
:2228 SYNC POINT DESCRIPTION
:2229 SUBTST 1 - SYNCFF--SIGN OF SOURCE GETS LOADED
:2230 SUBTST 2 - SYNCOE--SIGN OF SOURCE GETS LOADED
:2231 --
:2232 *****
:2233 =0
U 1022, 0018,0039,0580,09F8,0000,1191 :2234 T13E: NEWTST[.1]
U 1023, 0003,003C,0180,0A80,0000,1024 :2235 R[0] 0 ; INIT DATA TO SETUP SS
U 1024, 0818,0039,5D80,0800,0000,11AA :2236 =0 D_K[7],CALL,J/DCO ; GEN ADDRESS OF IB DATA
U 1025, 0001,003C,0180,0A88,0000,1201 :2237 R[1]_D
:2238
:2239 ;////////////////////////////////////
:2240 ++
:2241 CHECK WITH IR<1>=0
:2242 --
:2243
U 1201, 0018,0038,0980,09F0,0000,1028 :2244 T13ES1: RC[OE] K[.2] ; SET THE LOOP COUNT
U 1028, 0000,003D,0180,0800,0000,11BF :2245 =0 SUBTEST
U 1029, 0000,003C,0180,0800,0000,102A :2246 NOP
U 102A, 2000,003D,0180,0A08,4200,11DF :2247 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 102B, 0000,003C,0180,0800,0000,102C :2248 NOP
U 102C, 0000,003D,0180,0800,0000,11A5 :2249 =0 ERLOOP
U 102D, 0000,003C,0181,0A00,0000,1203 :2250 T13EL1: ALU_R[0],SGN/LOAD.SS ; INIT THE SS
U 1203, 0000,003C,0186,0A00,0000,1205 :2251 SYNCFF: ALU_R[0],SGN/ADD.SUB ; EXECUTE THE TEST FUNCTION
U 1205, 0000,123C,0180,0800,0000,100E :2252 EALU? ; BRANCH IF SS BAD
U 100E, 0000,003C,0180,0800,0000,1207 :2253 =1110 J/T19P1
U 100F, 0000,003D,0180,0800,0000,11A6 :2254 ERROR1 ; SS SHOULD BE CLEAR
U 1207, 0018,0038,4580,0A80,0000,1209 :2255 T19P1: R[0] K[.8000] ; SELECT NEW DATA TO INIT SS
U 1209, 0810,0038,0180,0970,0000,120A :2256 D_RC[OE]
U 120A, 0019,8000,0580,09F0,0010,120B :2257 RC[OE]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 120B, 0000,013C,0180,0800,0000,1030 :2258 Z?
U 1030, 0000,003C,0180,0800,0000,102D :2259 =0 J/T13EL1
:2260
:2261
:2262 ;////////////////////////////////////

```

```

:2263 :+
:2264 : NOW CHECK WITH IR<1>=1
:2265 :-
:2266
U 1031, 0000,003C,0180,0A08,0000,120C :2267 T13ES2: LAB R[1]
U 120C, 0018,0014,0580,0A88,0000,1032 :2268 R[1] LA+K[.1] ; INCREMENT ADR OF IB DATA
U 1032, 0000,003D,0180,0800,0000,11BF :2269 =0 SUBTEST
U 1033, 0003,003C,0180,0A80,0000,120D :2270 R[0] 0 ; INIT VALUE OF SS
U 120D, 0018,0038,0980,09F0,0000,1034 :2271 RC[OE] K[.2] ; SET THE LOOP COUNT
U 1034, 2000,003D,0180,0A08,4200,11DF :2272 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1035, 0000,003C,0180,0800,0000,1038 :2273 NOP
U 1038, 0000,003D,0180,0800,0000,11A5 :2274 =0 ERLOOP
U 1039, 0000,003C,0181,0A00,0000,120E :2275 T13EL2: ALU_R[0],SGN/LOAD.SS ; INIT THE SS
U 120E, 0000,003C,0186,0A00,0000,120F :2276 SYNCOE: ALU_R[0],SGN/ADD.SUB ; EXECUTE THE TEST FUNCTION
U 120F, 0000,123C,0180,0800,0000,101E :2277 EALD?
U 101E, 0000,003D,0180,0800,0000,11A6 :2278 =1110 ERROR1 ; SS DID NOT SET
U 101F, 0018,0038,4580,0A80,0000,1210 :2279 R[0] K[.8000]
U 1210, 0810,0038,0180,0970,0000,1211 :2280 D RC[OE]
U 1211, 0019,8000,0580,09F0,0010,1212 :2281 RC[OE]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 1212, 0000,013C,0180,0800,0000,103A :2282 Z?
U 103A, 0000,003C,0180,0800,0000,1039 :2283 =0 J/T13EL2
U 103B, 0000,003C,0180,0800,0000,103C :2284 NOP
:2285
:2286
:2287 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2288 :Z 70
:2289 :$ 0200
:2290

```

```

:2291 .PAGE 'TEST 13F INSTRUCTION DEPENDENT ALU ROM'
:2292 *****
:2293 ++
:2294 .TEST 13F INSTRUCTION DEPENDENT ALU ROM
:2295
:2296 .TEST DESCRIPTION
:2297 THIS TEST LOADS THE INSTRUCTION BUFFER WITH OPCODES AND PUTS DATA
:2298 ON THE ALEG AND BLEG OF THE ALU TO TEST EACH POSSIBLE FUNCTION OF
:2299 THE ALU IN INSTRUCTION DEPENDENT MODE. FOLLOWING IS A LIST OF THE
:2300 OPCODES, THE ALU FUNCTION, THE ALEG AND BLEG DATA, AND THE EXPECTED
:2301 ALU OUTPUT THAT IS USED IN THIS TEST.
:2302 THE ALEG, BLEG, AND EXPECTED ALU DATA ARE ALSO FETCHED FROM THE
:2303 CACHE.
:2304
:2305 .VAX MODE
:2306
:2307 .
:2308 .
:2309 .
:2310 .
:2311 .
:2312 .
:2313 .
:2314 .
:2315 .
:2316 .
:2317 .
:2318 .
:2319 .
:2320 .
:2321 .
:2322 .
:2323 .
:2324 .
:2325 .
:2326 .
:2327 .
:2328 .
:2329 .
:2330 .
:2331 .
:2332 .
:2333 .
:2334 .
:2335 .
:2336 .
:2337 .
:2338 .
:2339 .
:2340 .
:2341 .
:2342 .
:2343 .
:2344 .
:2345 .

```

OPCODE	ALUFCT	ALEG	BLEG	ALU
80	A PL B	9	5	0E
82	A MI B	9	5	4
88	A + B	55	AA	FF
8A	A * -B	FF	00	FF
8C	A XOR B	55	AA	FF
8E	0 MI B	FF	01	FF
90	B	01	FF	FF
91	A-B-1	02	01	00
92	-B	00	00	FF
93	A * B	55	AA	00
94	0	55	AA	00
96	A PL 1	FF	FF	00
97	A MI 1	01	01	00
E6	A + -B	55	55	FF
D8	A+B+PSLC	FE	01	FF,00
D9	A-B-PSLC	02	01	01,00
F8	A-B--PSLC	02	01	00,01

```

:2328 .
:2329 .
:2330 .
:2331 .
:2332 .
:2333 .
:2334 .
:2335 .
:2336 .
:2337 .
:2338 .
:2339 .
:2340 .
:2341 .
:2342 .
:2343 .
:2344 .
:2345 .

```

COMPATABILITY MODE	OCTAL OPCODE
6000	060000
E400	162000
5000	050000
4000	040000
7800	074000
8B00	105400
1000	010000
2000	020000
3000	030000
0A00	005000
0A80	005200
0AC0	005300
0A40	005100
0CC0	006300

```

:2346 : 0C40 A PL A+C 55 FF AB 006100
:2347 :
:2348 : SUBTST 1 - CHECK VAX MODE FUNCTIONS EXCLUDING THOSE WITH C BIT
:2349 : SUBTST 2 - CHECK VAX MODE FUNCTIONS THAT REQUIRE C BIT
:2350 : SUBTST 3 - CHECK THE COMPATABILITY MODE FUNCTIONS
:2351 :
:2352 : LOGIC DESCRIPTION
:2353 : THIS TEST CHECKS THAT THE OPCODE BITS FROM THE INSTRUCTION BUFFER
:2354 : ARE RECEIVED ON THE DAP MODULE AND THAT THE ALU ROMS FUNCTION CORRECTLY
:2355 : ON THE DAP MODULE. THE 3 OPCODES THAT USE THE PSL C BIT ALSO USE A
:2356 : SPECIAL CIRCUIT ON THE DAP MODULE.
:2357 :
:2358 : ERROR DESCRIPTION
:2359 : DATA: EXPECTED ALU OUTPUT
:2360 : RECEIVED ALU OUTPUT
:2361 : LOOP COUNT -- INDICATES WHICH OPCODE (AND ALU FUNCTION AND
:2362 : DATA) IS CURRENTLY BEING TESTED.
:2363 : LOOP COUNT - SUBTEST 2 ONLY -- INDICATES WHETHER THE PSL C BIT
:2364 : IS SET OR CLEAR, I.E. 2=PSL C CLEAR, 1=PSL C SET
:2365 :
:2366 : SYNC POINT DESCRIPTION
:2367 : SUBTST 1 - SYNC0F--ALU FUNCTION IS EXECUTED
:2368 : SUBTST 2 - SYNC10--ALU FUNCTION IS EXECUTED
:2369 : SUBTST 3 - SYNC11--ALU FUNCTION IS EXECUTED
:2370 :
:2371 : *****
:2372 : =0
:2373 : T13F: NEWTST[.3]
:2374 : R[1]_K[.B0]
:2375 : =0 D_K[.7],CALL,J/DC4 ; ADR OF ALEG DATA
:2376 : R[2]_D
:2377 : R[3]_K[.88] ; ADR OF B LEG DATA
:2378 : =0 D_K[.9],CALL,J/DCC ; ADR OF ALU OUTPUT DATA
:2379 : R[4]_D
:2380 :
:2381 : //////////////////////////////////////
:2382 : +
:2383 : CHECK VAX MODE FUNCTIONS EXCEPT THOSE REQUIRING C BIT
:2384 : -
:2385 :
:2386 : T13FS1: D_K[D]
:2387 : R[0C]_D+K[.1] ; SET THE LOOP COUNT
:2388 : =0 SUBTEST
:2389 : T13FL1: VA_R[2]
:2390 : D[BYTE]_CACHE.P ; GET ALEG DATA
:2391 : D_D.AND_K[.FF] ; MASK
:2392 : R[5]_D
:2393 : VA_R[4]
:2394 : D[BYTE]_CACHE.P ; GET ALU OUTPUT DATA
:2395 : D_D.AND_K[.FF] ; MASK
:2396 : R[0E]_D
:2397 : VA_R[3]
:2398 : D[BYTE]_CACHE.P ; GET B LEG DATA
:2399 : D_D.AND_K[.FF] ; MASK
:2400 : R[6]_D

```

U 103C, 0018,0039,0D80,09F8,0000,1191
 U 103D, 0018,0038,9580,0A88,0000,1040
 U 1040, 0818,0039,5D80,0800,0000,11AE
 U 1041, 0001,003C,0180,0A90,0000,1213
 U 1213, 0018,0038,C580,0A98,0000,1042
 U 1042, 0818,0039,D980,0800,0000,1186
 U 1043, 0001,003C,0180,0AA0,0000,1214

U 1214, 0818,0038,8980,0800,0000,1215
 U 1215, 0019,0014,0580,09E0,0000,1044
 U 1044, 0000,003D,0180,0800,0000,11BF
 U 1045, 0000,003C,0180,0A10,0200,1216
 U 1216, 0000,803C,0180,C800,0000,1217
 U 1217, 0819,0034,4980,0800,0000,1218
 U 1218, 0001,003C,0180,0AA8,0000,1219
 U 1219, 0000,003C,0180,0A20,0200,121A
 U 121A, 0000,803C,0180,C800,0000,121B
 U 121B, 0819,0034,4980,0800,0000,121C
 U 121C, 0001,003C,0180,09F0,0000,121D
 U 121D, 0000,003C,0180,0A18,0200,121E
 U 121E, 0000,803C,0180,C800,0000,121F
 U 121F, 0819,0034,4980,0800,0000,1220
 U 1220, 0001,003C,0180,0AB0,0000,1046

ZZ-ESKAH-V132 TEST 13F INSTRUCTION DEPENDENT
ESKAH38.MCR MICRO2 1M(01)ALU ROM
16-DEC-82 12:24:52

```

U 1046, 0000,003D,0180,0800,0000,11A5 :2401 =0 ERLOOP
U 1047, 0800,003C,0180,0A28,0000,1221 :2402 D_R[5]
U 1221, 0000,003C,01C0,0A30,0000,1048 :2403 Q_R[6]
U 1048, 2000,003D,0180,0A08,4200,11DF :2404 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1049, 001D,000C,01C0,0800,0000,1222 :2405 SYNCOF: Q_D[INST.DEF]Q ; EXECUTE THE ALU FUNCTION
U 1222, 0810,0038,0180,0970,0000,1223 :2406 D_RC[0E] ; GET EXPECTED RESULT
U 1223, 001D,A000,0180,0800,0010,1224 :2407 A[U_Q-D,CLK.UBCC,BYTE ; CHECK THE RESULT
U 1224, 0000,013C,0180,0800,0000,104A :2408 Z? ; BRANCH IF OK
U 104A, 0001,203D,0180,09E8,0000,11AB :2409 =0 ERROR2,RC[0D]_Q
:2410
:2411 ;+
:2412 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2413 ; -
:2414
U 104B, 0000,003C,0180,0A08,0000,1225 :2415 LAB R[1]
U 1225, 0018,0014,0580,0A88,0000,1226 :2416 R[1] LA+K[.1] ; INCREMENT IB ADR
U 1226, 0000,003C,0180,0A10,0000,1227 :2417 LAB R[2]
U 1227, 0018,0014,0580,0A90,0000,1228 :2418 R[2] LA+K[.1] ; INCREMENT ADR OF A LEG DATA
U 1228, 0000,003C,0180,0A18,0C00,1229 :2419 LAB R[3]
U 1229, 0018,0014,0580,0A98,0000,122A :2420 R[3] LA+K[.1] ; INCRE ADR OF B LEG DATA
U 122A, 0000,003C,0180,0A20,0000,122B :2421 LAB R[4]
U 122B, 0018,0014,0580,0AA0,0000,122C :2422 R[4] LA+K[.1] ; INCRE ADR OF ALU OUTPUT DATA
U 122C, 0810,0038,0180,0960,0000,122D :2423 D_RC[0C]
U 122D, 0019,8000,0580,09E0,0010,122E :2424 R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 122E, 0000,013C,0180,0800,0000,104C :2425 Z?
U 104C, 0000,003C,0180,0800,0000,1045 :2426 =0 J/T13FL1
:2427
:2428
:2429 ;////////////////////
:2430 ;+
:2431 ; NOW CHECK THE THREE FUNCTIONS WITH THE PSL C BIT
:2432 ; -
:2433
U 104D, 0F18,0038,0980,09D8,0000,122F :2434 T13FS2: RC[0B] K[.2],D_0 ; SET LOOP COUNT
U 122F, 0000,003C,3DF0,2C00,0000,1230 :2435 Q_ID[PSL] ; GET THE PSL
U 1230, 0819,2024,6180,0800,0000,1231 :2436 D_Q.ANDNOT.K[.F] ; CLEAR THE CC'S
U 1231, 0000,003C,3D80,3C00,0000,1050 :2437 ID[PSL] D ; LOAD THE PSL
U 1050, 0000,003D,1180,0800,0084,71C1 :2438 =0 SETRCF[.4]
U 1051, 0000,003C,0180,0800,0000,1052 :2439 NOP
U 1052, 0000,003D,0180,0800,0000,11BF :2440 =0 SUBTEST
U 1053, 0018,0038,0D80,09E0,0000,1232 :2441 T13FL2: RC[0C] K[.3] ; SET LOOP FOR 3 FUNCTIONS
U 1232, 0000,003C,0180,0A10,0200,1233 :2442 T13FL3: VA R[2]
U 1233, 0000,803C,0180,C800,0000,1234 :2443 D[BYTE]_CACHE.P ; GET ALEG DATA
U 1234, 0001,003C,0180,0AAB,0000,1235 :2444 R[5] D
U 1235, 0000,003C,0180,0A20,0200,1236 :2445 VA R[4]
U 1236, 0000,803C,0180,C800,0000,1237 :2446 D[BYTE]_CACHE.P ; GET ALU OUTPUT DATA
U 1237, 0001,003C,0180,09F0,0000,1238 :2447 RC[0E] D
U 1238, 0000,003C,0180,0A18,0200,1239 :2448 VA R[3]
U 1239, 0000,803C,0180,C800,0000,123A :2449 D[BYTE]_CACHE.P ; GET B LEG DATA
U 123A, 0001,003C,0180,0AB0,0000,1054 :2450 R[6] D
U 1054, 0000,003D,0180,0800,0000,11A5 :2451 =0 ERLOOP
U 1055, 0800,003C,0180,0A28,0000,123B :2452 D_R[5]
U 123B, 0000,003C,01C0,0A30,0000,1056 :2453 Q_R[6]
U 1056, 2000,003D,0180,0A08,4200,11DF :2454 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1057, 001D,000C,01C0,0800,0000,123C :2455 SYNC10: Q_D[INST.DEF]Q ; EXECUTE THE ALU FUNCTION

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U 123C, 0810,0038,0180,0970,0000,123D :2456      D RC[0E]      : GET EXPECTED RESULT
U 123D, 001D,A000,0180,0800,0010,123E :2457      A[U_Q-D,CLK.UBCC,BYTE : CHECK THE RESULT
U 123E, 0000,013C,0180,0800,0000,1058 :2458      Z?      : BRANCH IF OK
U 1058, 0001,203D,0180,09E8,0000,11AB :2459      =0      ERROR2,RC[0D]_Q
:2460
:2461      ;+
:2462      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2463      ; -
:2464
U 1059, 0000,003C,0180,0A08,0000,123F :2465      LAB R[1]
U 123F, 0018,0014,0580,0A88,0000,1240 :2466      R[1] LA+K[.1]      : INCREMENT IB ADR
U 1240, 0000,003C,0180,0A10,0000,1241 :2467      LAB R[2]
U 1241, 0018,0014,0580,0A90,0000,1242 :2468      R[2] LA+K[.1]      : INCREMENT ADR OF A LEG DATA
U 1242, 0000,003C,0180,0A18,0000,1243 :2469      LAB R[3]
U 1243, 0018,0014,0580,0A98,0000,1244 :2470      R[3] LA+K[.1]      : INCRE ADR OF B LEG DATA
U 1244, 0000,003C,0180,0A20,0000,1245 :2471      LAB R[4]
U 1245, 0018,0014,0580,0AA0,0000,1246 :2472      R[4] LA+K[.1]      : INCRE ADR OF ALU OUTPUT DATA
U 1246, 0810,0038,0180,0960,0000,1247 :2473      D RC[0C]
U 1247, 0019,8000,0580,09E0,0010,1248 :2474      R[0C]_D-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
U 1248, 0000,013C,0180,0800,0000,105C :2475      Z?
U 105C, 0000,003C,0180,0800,0000,1232 :2476      =0      J/T13FL3
U 105D, 0818,0038,0580,0800,0000,1249 :2477      D_K[.1]
U 1249, 0000,003C,3DF0,2C00,0000,124A :2478      Q_ID[PSL]      : READ THE PSL
U 124A, 0019,2024,61C0,0800,0000,124B :2479      Q_Q.ANDNOT.K[.F] : CLEAR THE CC'S
U 124B, 081D,0030,0180,0800,0000,124C :2480      D_D.OR.Q      : INSERT THE C BIT
U 124C, 0000,003C,3D80,3C00,0000,124D :2481      ID[PSL]_D      : SET THE C BIT
U 124D, 0810,0038,0180,0958,0000,124E :2482      D RC[0B]
U 124E, 0019,8000,0580,09D8,0010,124F :2483      R[0B]_D-K[.1],CLK.UBCC,BYTE
U 124F, 0000,013C,0180,0800,0000,1060 :2484      Z?
U 1060, 0000,003C,0180,0800,0000,1053 :2485      =0      J/T13FL2
:2486
:2487
:2488      ;////////////////////
:2489      ;+
:2490      ; NOW CHECK COMPATABILITY MODE
:2491      ; -
:2492
U 1061, 0818,0038,D180,0800,0000,1250 :2493      T13FS3: D_K[.C0]
U 1250, 0019,0014,1180,0A90,0000,1062 :2494      R[2] D+K[.4]
U 1062, 0000,003D,0D80,0800,0084,71C1 :2495      =0      SETR[F[.3]
U 1063, 0000,003C,0180,0800,0000,1064 :2496      NOP
U 1064, 0818,0039,8980,0800,0000,11AE :2497      =0      D_K[.D],CALL,J/DC4      : GEN ADR OF BLEG DATA
U 1065, 0001,003C,0180,0A98,0000,1066 :2498      R[3]_D
U 1066, 0000,003D,0180,0800,0000,11BF :2499      =0      SUBTEST
U 1067, 0818,0038,CD80,0800,0000,1251 :2500      D_K[.F0]      : GEN ADR OF ALU DATA
U 1251, 0019,0000,0180,0AA0,0000,1252 :2501      R[4]_D-K[.8]      : EQUALS E8(16)
U 1252, 0818,0038,4980,0800,0000,1253 :2502      D_K[.FF]      : GEN ADR OF IB DATA
U 1253, 0019,0000,0D80,0A88,0000,1254 :2503      R[1]_D-K[.3]      : EQUALS FC(16)
U 1254, 0818,0038,0580,0800,0000,1255 :2504      D_K[.1]
U 1255, 0000,003C,3D80,3C00,0000,1256 :2505      ID[PSL]_D      : SET THE C BIT IN THE PSL
:2506
U 1256, 0018,0038,6180,09E0,0000,1257 :2507      R[0C]_K[.F]      : SET THE LOOP COUNT
U 1257, 0000,003C,0180,0A10,0200,1258 :2508      T13FL4: VA R[2]      : GET ALEG DATA
U 1258, 0000,803C,0180,C800,0000,1259 :2509      D[BYTE]_CACHE.P
U 1259, 0001,003C,0180,0AAB,0000,125A :2510      R[5]_D      : SAVE IN R5

```

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U 125A, 0000,003C,0180,0A20,0200,125B :2511      VA R[4]                ; GET ALU OUTPUT DATA
U 125B, 0000,803C,0180,C800,0000,125C :2512      D[BYTE]_CACHE.P
U 125C, 0001,003C,0180,09F0,0000,125D :2513      RC[OE] D            ; SAVE IN RC E
U 125D, 0000,003C,0180,0A18,0200,125E :2514      VA R[3]                ; GET BLEG DATA
U 125E, 0000,803C,0180,C800,0000,125F :2515      D[BYTE]_CACHE.P
U 125F, 0001,003C,0180,0AB0,0000,1068 :2516      R[6] D            ; SAVE IN R6
U 1068, 0000,003D,0180,0800,0000,11A5 :2517      ERLOOP
U 1069, 0000,003C,0180,0800,0000,106A :2518      NOP
U 106A, 2000,003D,0180,0A08,4200,11DF :2519      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 106B, 0000,003C,0180,0800,0000,106C :2520      NOP
U 106C, 0000,003D,0180,0800,0000,11E6 :2521      =0      CALL,J/SETCM          ; SET THE CM BIT
U 106D, 0800,003C,0180,0A28,0000,1260 :2522      D_R[5]                ; GET ALEG DATA
U 1260, 0000,003C,01C0,0A30,0000,1261 :2523      Q_R[6]                ; GET BLEG DATA
U 1261, 001D,000C,01C0,0800,0000,1262 :2524      SYNC11: Q_D[INST.DEF]Q    ; EXECUTE THE FUNCTION
U 1262, 0810,0038,0180,0970,0000,1263 :2525      D_RC[OE]            ; GET EXPECTED ALU OUTPUT
U 1263, 001D,A000,0180,0800,0010,1264 :2526      A[U_Q-D,CLK.UBCC,BYTE    ; CHECK THE RESULT
U 1264, 0000,013C,0180,0800,0000,106E :2527      Z?
U 106E, 0001,A03D,0180,09E8,0000,11AB :2528      =0      ERROR2,RC[OD]_Q,BYTE          ; ALU OUTPUT INCORRECT
:2529
:2530
:2531      ;+
:2532      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2533      ;-

```

```

U 106F, 0000,003C,0180,0A08,0000,1265 :2534      LAB R[1]
U 1265, 0018,0014,0980,0A88,0000,1266 :2535      R[1] LA+K[.2]          ; INCREMENT ADR OF IB DATA
U 1266, 0000,003C,0180,0A10,0000,1267 :2536      LAB R[2]
U 1267, 0018,0014,0580,0A90,0000,1268 :2537      R[2] LA+K[.1]          ; INCREMENT ADR OF ALEG DATA
U 1268, 0000,003C,0180,0A18,0000,1269 :2538      LAB R[3]
U 1269, 0018,0014,0580,0A98,0000,126A :2539      R[3] LA+K[.1]          ; INCREMENT ADR OF BLEG DATA
U 126A, 0000,003C,0180,0A20,0000,126B :2540      LAB R[4]
U 126B, 0018,0014,0580,0AA0,0000,126C :2541      R[4] LA+K[.1]          ; INCREMENT ADR OF ALU DATA
U 126C, 0810,0038,0180,0960,0000,126D :2542      D_RC[CC]
U 126D, 0019,8000,0580,09E0,0010,126E :2543      R[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE BYTE COUNT
U 126E, 0000,013C,0180,0800,0000,1070 :2544      Z?
U 1070, 0000,003C,0180,0800,0000,1257 :2545      =0      J/T13FL4
U 1071, 0000,003C,0180,0800,0000,1072 :2546      NOP
:2547
:2548
:2549
:2550
:2551
:2552
:2553
:2554
:2555
:2556
:2557
:2558
:2559
:2560
:2561
:2562
:2563
:2564
:2565

```

; FOLLOWING IS THE ALEG DATA FOR THE ABOVE TEST

```

:2550      % 74
:2551      ; SUBTEST 1
:2552      $ 0909,FF55,FF55,0200,5500,FF55,5501
:2553      ; SUBTEST 2
:2554      $ 02FE,FE02,0202
:2555

```

; FOLLOWING IS THE B LEG DATA FOR THE ABOVE TEST:

```

:2557      % 88
:2558      ; SUBTEST 1
:2559      $ 0505,00AA,01AA,01FF,AA00,FFAA,5501
:2560      ; SUBTEST 2
:2561      $ 0101,0101,0101
:2562

```

; FOLLOWING IS THE EXPECTED ALU OUTPUT FOR THE ABOVE TEST:

```

:2564      % 9C
:2565      ; SUBTEST 1

```

```

:2566 :$ 040E,FFFF,FFFF,00FF,00FF,0000,FF00
:2567 : SUBTEST 2
:2568 :$ 01FF,0000,0100
:2569 :
:2570 : FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
:2571 :% B0
:2572 : SUBTEST 1
:2573 :$ 8280,8A88,8E8C,9190,9392,9694,E697
:2574 : SUBTEST 2
:2575 :$ D9D8,D8F8,F8D9
:2576 :
:2577 :
:2578 : THE FOLLOWING IS THE COMPATABILITY MODE DATA FOR THE ABOVE TEST:
:2579 : THESE ARE ONLY USED IN SUBTEST 3
:2580 : ALEG DATA
:2581 :% C4
:2582 :$ 0909,FF55,FF55,0200,5555,01FF,5500,0055
:2583 :
:2584 : BLEG DATA
:2585 :% D4
:2586 :$ 0505,00AA,01AA,01FF,AAAA,01FF,FFFF,FFFF
:2587 :
:2588 : ALU OUTPUT DATA
:2589 :% E8
:2590 :$ 040E,FFFF,FFFF,00FF,0000,0000,AAFF,00AB
:2591 :
:2592 : IB DATA
:2593 : SEE THE TEST HEADER FOR THE EQUIVALENT OCTAL DATA FOR THE FOLLOWING OPCODES
:2594 :% FC
:2595 :$ 6000,E400,5000,4000,7800,8B00,1000,2000,3000,0A00,0A80,0AC0,0A40,0CC0,0C40
:2596 :
:2597 :

```



```

:2598 .PAGE "TEST 140 COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)"
:2599 .....
:2600 **
:2601 TEST 140 COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)
:2602
:2603 TEST DESCRIPTION
:2604 THIS TEST FLOATS A ONE AND A ZERO THRU THE CONDITION CODES USING
:2605 THE CONDITION CODE LOADS OF 1, 2, AND 4. IT ALSO CHECKS BOTH
:2606 CONDITIONS (ONE AND ZERO) OF THE C AND V BIT FOR CONDITION CODE
:2607 LOADS OF 3, 5, AND 6. ALL OF THESE CASES CAUSE THE CURRENT VALUE
:2608 OF THE CONDITION CODE BIT TO BE WRITTEN INTO ITSELF.
:2609
:2610 SUBTST 1 - CHECK THE CONDITION CODE LOAD = 1.
:2611 SUBTST 2 - CHECK THE CONDITION CODE LOAD = 2
:2612 SUBTST 3 - CHECK THE CONDITION CODE LOAD = 3 (C AND V BIT)
:2613 SUBTST 4 - CHECK THE CONDITION CODE LOAD = 5 (C AND V BIT)
:2614 SUBTST 5 - CHECK THE CONDITION CODE LOAD = 6 (C AND V BIT)
:2615
:2616 LOGIC DESCRIPTION
:2617 THIS TEST CHECKS PART OF THE CONDITION CODE ROMS, AND THE
:2618 MULTIPLEXORS THAT FEED THE CONDITION CODE LATCH ON THE CEH
:2619 MODULE.
:2620
:2621 ERROR DESCRIPTION
:2622 DATA: EXPECTED CONDITION CODES
:2623 RECEIVED CONDITION CODES
:2624 LOOP COUNT
:2625 SUBTST 1,2 - INDICATES WHICH DATA PATTERN IS BEING TESTED
:2626 I.E. 8=0001, 7=0010, 6=0100, 5=1000, 4=1110, 3=1101, ETC.
:2627 SUBTST 3 - INDICATES EXPECTED CONFIGURATION OF C AND V BITS
:2628 I.E. 2=01, 1=10
:2629 NOT USED FOR SUBTEST 4 AND 5.
:2630
:2631 SYNC POINT DESCRIPTION
:2632 SUBTST 1 - SYNC02--EXECUTE UCCK = 1
:2633 SUBTST 2 - SYNC03--EXECUTE UCCK = 2
:2634 SUBTST 3 - SYNC05--EXECUTE UCCK = 3
:2635 SUBTST 4 - SYNC06--EXECUTE UCCK = 5
:2636 SUBTST 5 - SYNC07--EXECUTE UCCK = 6
:2637 --
:2638 .....
:2639 =0
:2640 T140: NEWTST[.4]
:2641 D K[.4] ; GET A CONSTANT 5
:2642 R[5]_D+K[.1]
:2643
:2644 ;////////////////////////////////////
:2645 *
:2646 ; FLOAT A 1 AND A ZERO THROUGH THE CC'S WITH UCCK=1
:2647 -
:2648
:2649 T140S1: RC[0C] K[.8] ; SET THE LOOP COUNT
:2650 =0 SUBTEST
:2651 RC[0E] K[.1] ; INIT THE TEST DATA
:2652 =0 ERLOOP

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U 1072, 0018,0039,1180,09F8,0000,1191
 U 1073, 0818,0038,1180,0800,0000,126F
 U 126F, 0019,0014,0580,0AA8,0000,1270

U 1270, 0018,0038,0180,09E0,0000,1074
 U 1074, 0000,003D,0180,0800,0000,11BF
 U 1075, 0018,0038,0580,09F0,0000,1076
 U 1076, 0000,003D,0180,0800,0000,11A5

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U 1077, 0810,0038,0180,0970,0000,1271 :2653 T140L1: D RC[OE] ; PUT DATA PATTERN IN D REG
U 1271, 0000,003C,3D80,3C00,0000,1272 :2654 ID[PSL] D ; LOAD THE CC'S
U 1272, 0000,003C,0180,0800,0010,1273 :2655 SYNC02: CLK.UBCC ; EXECUTE THE TEST INSTRUCTION
U 1273, 0000,003C,3DF0,2C00,0000,1274 :2656 Q_ID[PSL] ; READ THE CC'S BACK
U 1274, 0019,2034,61C0,0800,0000,1275 :2657 Q-Q.AND.K[F] ; MASK THE RECEIVED DATA
U 1275, 001D,A000,0180,0800,0010,1276 :2658 A[U_Q-D,CLK.UBCC,BYTE] ; CHECK THE RECEIVED DATA
U 1276, 0000,013C,0180,0800,0000,1078 :2659 Z?
U 1078, 0001,203D,0180,09E8,0000,11A8 :2660 =0 ERROR2,RC[OD],Q
:2661
:2662
:2663 ;+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2664 :-
:2665
U 1079, 0810,0038,0180,0960,0000,1277 :2666 D_RC[OC] ; GET THE LOOP COUNT
U 1277, 0000,003C,01C0,0A28,0000,1278 :2667 Q-R[5] ; GET CONSTANT 5
U 1278, 001D,8000,0180,0800,0010,1279 :2668 A[U_D-Q,CLK.UBCC,BYTE] ; TIME TO FLOAT A ZERO?
U 1279, 0000,013C,0180,0800,0000,107A :2669 Z? ; BRANCH IF YES
U 107A, 0000,003C,0180,0800,0000,127B :2670 =0 J/T140P1
U 107B, 0018,0038,89C0,0800,0000,127A :2671 Q_K[D]
U 127A, 0019,2014,0580,09F0,0000,1281 :2672 RC[OE]_Q+K[.1],J/T140P4 ; INIT DATA FOR FLOATING ZERO
U 127B, 0000,003C,01C0,0A28,0000,127C :2673 T140P1: Q-R[5]
U 127C, 001D,8000,0180,0800,0010,127D :2674 A[U_D-Q,CLK.UBCC,BYTE] ; FLOATING A ZERO OR A ONE?
U 127D, 0010,1B38,01C0,0970,0000,1027 :2675 ALU_N?,Q_RC[OE] ; BRANCH IF FLOATING A ZERO
U 1027, 0000,003C,0180,0800,0000,127E :2676 =0111 J/T140P2
U 102F, 0000,003C,03A8,0800,0000,127F :2677 Q-Q.LEFT,SI/MUL-,J/T140P3 ; SHIFT THE ZERO INSERTING A 1
U 127E, 0000,003C,01A8,0800,0000,127F :2678 T140P2: Q-Q.LEFT,SI/ZERO ; SHIFT THE ONE INSERTING A ZERO
U 127F, 0019,2034,61C0,0800,0000,1280 :2679 T140P3: Q-Q.AND.K[F]
U 1280, 0001,203C,0180,09F0,0000,1281 :2680 RC[OE]_Q ; SAVE IN RC E
U 1281, 0019,8000,0580,09E0,0010,1282 :2681 T140P4: RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 1282, 0000,013C,0180,0800,0000,107C :2682 Z? ; BRANCH IF DONE
U 107C, 0000,003C,0180,0800,0000,1077 :2683 =0 J/T140L1 ; CONTINUE
:2684
:2685
:2686 ;////////////////////
:2687 ;+
:2688 ; FLOAT A ONE AND A ZERO THROUGH THE CC'S WITH A UCCK=2
:2689 :-
:2690
U 107D, 0016,0038,0180,09E0,0000,107E :2691 T140S2: RC[OC]_K[.8] ; SET THE LOOP COUNT
U 107E, 0018,0039,0580,0A90,0000,11BF :2692 =0 SUBTEST,R[2],K[.1]
U 107F, 0018,0038,0D80,09F0,0000,1080 :2693 RC[OE]_K[.3] ; INIT THE EXPECTED CC'S
:2694
:2695 =0 ERLOOP
U 1080, 0000,003D,0180,0800,0000,11A5 :2696 T140L2: D R[2] ; GET THE TEST PATTERN
U 1081, 0800,003C,0180,0A10,0000,1283 :2697 ID[PSL] D ; LOAD THE CC'S
U 1283, 0000,003C,3D80,3C00,0000,1284 :2698 SYNC03: D_RC[OE],SET.V ; EXECUTE THE TEST INSTRUCTION
U 1284, 0810,0038,0180,0970,0020,1285 :2699 Q_ID[PSL] ; GET THE CC'S
U 1285, 0000,003C,3DF0,2C00,0000,1286 :2700 Q-Q.AND.K[F] ; MASK THE CC'S
U 1286, 0019,2034,61C0,0800,0000,1287 :2701 A[U_Q-D,CLK.UBCC,BYTE] ; CHECK THE CC'S
U 1287, 001D,A000,0180,0800,0010,1288 :2702 Z? ; BRANCH IF OK
U 1288, 0000,013C,0180,0800,0000,1082 :2703 =0 ERROR2,RC[OD],Q
U 1082, 0001,203D,0180,09E8,0000,11A8 :2704
:2705
:2706 ;+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2707 :-

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:2708
U 1083. 0810.0038.0180.0960.0000.1289 :2709 D_RC[OC] : GET THE LOOP COUNT
U 1289. 0000.003C.01C0.0A28.0000.128A :2710 Q-R[5] : GET A CONSTANT 5
U 128A. 001D.8000.0180.0800.0010.128B :2711 A[U_D-Q,CLK,UBCC,BYTE] : TIME TO FLOAT A ZERO?
U 128B. 0000.013C.0180.0800.0000.1084 :2712 Z? : BRANCH IF YES
U 1084. 0000.003C.0180.0800.0000.128E :2713 =0 J/T140P5
U 1085. 0018.0038.89C0.0800.0000.128C :2714 Q_K[D]
U 128C. 0019.2014.0580.0A90.0000.128D :2715 R[2] Q+K[.1] : INIT DATA FOR FLOATING ZERO
U 128D. 0019.2014.0580.09F0.0000.1297 :2716 RC[OE] Q+K[.1],J/T140P8 : ...
U 128E. 0000.003C.01C0.0A28.0000.1290 :2717 T140P5: Q R[5]
U 1290. 001D.8000.0180.0800.0010.1291 :2718 A[U_D-Q,CLK,UBCC,BYTE] : FLOATING A ZERO OR ONE?
U 1291. 0000.1B3C.01C0.0A10.0000.1037 :2719 ALU.N? Q_R[2] : BRANCH IF FLOATING A ZERO
U 1037. 0000.003C.0180.0800.0000.1292 :2720 =0111 J/T140P6
U 103F. 0000.003C.03A8.0800.0000.1293 :2721 Q_Q.LEFT,S1/MUL-,J/T140P7 : SHIFT THE ZERO INSERTING A 1
U 1292. 0000.003C.01A8.0800.0000.1293 :2722 T140P6: Q_Q.LEFT,S1/ZERO : SHIFT THE ONE INSERTING A ZERO
U 1293. 0019.2034.61C0.0800.0000.1294 :2723 T140P7: Q_Q.AND.K[F]
U 1294. 0001.203C.0180.0A90.0000.1295 :2724 R[2] Q : SAVE IN R2
U 1295. 0019.2030.09C0.0800.0000.1296 :2725 Q_Q.OR.K[.2] : INSERT THE V BIT
U 1296. 0001.203C.0180.09F0.0000.1297 :2726 RC[OE] Q : SAVE
U 1297. 0019.8000.0580.09E0.0010.1298 :2727 T140P8: RC[OC]_D-K[.1],CLK,UBCC,BYTE : DECREMENT THE LOOP COUNT
U 1298. 0000.013C.0180.0800.0000.1086 :2728 Z?
U 1086. 0000.003C.0180.0800.0000.1081 :2729 =0 J/T140L2
:2730
:2731
:2732 :////////////////////
:2733 :+
:2734 : UCCK FIELD = 3, CHECK THE C AND V BIT
:2735 :-
:2736
U 1087. 0018.0038.0980.09E0.0000.1088 :2737 T140S3: RC[OC] K[.2] : SET THE LOOP COUNT
U 1088. 0000.003D.0180.0800.0000.118F :2738 =0 SUBTEST
U 1089. 0018.0038.0580.09F0.0000.108A :2739 RC[OE] K[.1] : SET THE EXPECTED DATA
U 108A. 0000.003D.0180.0800.0000.11A5 :2740 =0 ERLOOP
U 108B. 0810.0038.0180.0970.0000.1299 :2741 T140L4: D_RC[OE] : GET THE EXPECTED DATA
U 1299. 0000.003C.3D80.3C00.0000.129A :2742 ID[PSL] D : LOAD C AND V
U 129A. 0000.003C.0180.0800.0030.129B :2743 SYNC05: SET.N.AND.Z : EXECUTE THE TEST INSTRUCTION
U 129B. 0000.003C.3DF0.2C00.0000.129C :2744 Q_ID[PSL] : READ THE CC'S
U 129C. 0019.2034.0DC0.0800.0000.129D :2745 Q_Q.AND.K[.3] : MASK THE C AND V BIT
U 129D. 001D.A000.0180.0800.0010.129E :2746 A[U_Q-D,CLK,UBCC,BYTE] : CHECK
U 129E. 0000.013C.0180.0800.0000.108C :2747 Z?
U 108C. 0001.203D.0180.09E8.0000.11A8 :2748 =0 ERROR2,RC[OD]_Q
U 108D. 0018.0038.0980.09F0.0000.129F :2749 RC[OE] K[.2] : SET COMPLIMENT DATA
U 129F. 0810.0038.0180.0960.0000.12A0 :2750 D_RC[OC] : GET THE LOOP COUNT
U 12A0. 0019.8000.0580.09E0.0010.12A1 :2751 RC[OC]_D-K[.1],CLK,UBCC,BYTE : DECREMENT THE LOOP COUNT
U 12A1. 0000.013C.0180.0800.0000.108E :2752 Z?
U 108E. 0000.003C.0180.0800.0000.108B :2753 =0 J/T140L4 : CONTINUE
:2754
:2755
:2756 :////////////////////
:2757 :+
:2758 : UCCK FIELD = 5, CHECK THE C AND V BIT
:2759 :-
:2760
U 108F. 0003.003C.0180.09F0.0000.1090 :2761 T140S4: RC[OE] 0 : SET THE EXPECTED CC'S
U 1090. 0000.003D.0980.0800.0084.71C1 :2762 =0 SETRCF[.2]

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U 1091, 0000,003C,0180,0800,0000,1092 :2763 NOP
U 1092, 0000,003D,0180,0800,0000,11BF :2764 =0 SUBTEST
U 1093, 0000,003C,0180,0800,0000,1094 :2765 NOP
U 1094, 0000,003D,0180,0800,0000,11A5 :2766 =0 ERLOOP
U 1095, 0818,0038,0980,0800,0000,12A2 :2767 D_K[.2] : INIT THE CC'S
U 12A2, 0000,003C,3D80,3C00,0000,12A3 :2768 ID[PSL]_D : INIT CC'S
U 12A3, 0810,0038,0180,0970,0050,12A4 :2769 SYNC06: D_RC[OE],SET.N&Z : EXECUTE TEST INSTRUCTION
U 12A4, 0000,003C,3DF0,2C00,0000,12A5 :2770 Q_ID[PSL] : GET C AND V
U 12A5, 0019,2034,0DC0,0800,0000,12A6 :2771 Q_Q.AND.K[.3] : MASK
U 12A6, 001D,A000,0180,0800,0010,12A7 :2772 A[U_Q-D,CLK.UBCC,BYTE : CHECK
U 12A7, 0000,013C,0180,0800,0000,1096 :2773 Z?
U 1096, 0001,203D,0180,09E8,0000,11A8 :2774 =0 ERROR2,RC[OD]_Q
U 1097, 0000,003C,0180,0800,0000,1098 :2775 NOP
U 1098, 0000,003D,0180,0800,0000,11A5 :2776 =0 ERLOOP
U 1099, 0818,0038,0580,0800,0000,12A8 :2777 D_K[.1] : INIT CC'S
U 12A8, 0000,003C,3D80,3C00,0000,12A9 :2778 ID[PSL]_D : ...
:2779 ;SYNC06:
:2780 D_RC[OE],SET.N&Z : EXECUTE TEST INSTRUCTION
U 12AB, 0000,003C,3DF0,2C00,0000,12AC :2781 Q_ID[PSL] : READ C AND V
U 12AC, 0019,2034,0DC0,0800,0000,12AD :2782 Q_Q.AND.K[.3] : MASK
U 12AD, 001D,A000,0180,0800,0010,12AE :2783 A[U_Q-D,CLK.UBCC,BYTE : OK?
U 12AE, 0000,013C,0180,0800,0000,109A :2784 Z?
U 109A, 0001,203D,0180,09E8,0000,11A8 :2785 =0 ERROR2,RC[OD]_Q
:2786
:2787
:2788 :////////////////////
:2789 :+
:2790 : UCCK FIELD = 6, CHECK THE C AND V BIT
:2791 :-
:2792
U 109B, 0018,0038,0580,09F0,0000,109C :2793 T140S5: RC[OE]_K[.1] : SET EXPECTED CC'S
U 109C, 0000,003D,0180,0800,0000,11BF :2794 =0 SUBTEST
U 109D, 0000,003C,0180,0800,0000,109E :2795 NOP
U 109E, 0000,003D,0180,0800,0000,11A5 :2796 =0 ERLOOP
U 109F, 0810,0038,0180,0970,0000,12AF :2797 D_RC[OE] : INIT THE CC'S
U 12AF, 0000,003C,3D80,3C00,0000,12B0 :2798 ID[PSL]_D : EXECUTE THE TEST INSTRUCTION
U 12B0, 0000,003C,0180,0800,0060,12B1 :2799 SYNC07: SET.PSL.C(AMX) : GET C AND V
U 12B1, 0000,003C,3DF0,2C00,0000,12B2 :2800 Q_ID[PSL] : MASK
U 12B2, 0019,2034,0DC0,0800,0000,12B3 :2801 Q_Q.AND.K[.3] : CHECK
U 12B3, 001D,A000,0180,0800,0010,12B4 :2802 A[U_Q-D,CLK.UBCC,BYTE
U 12B4, 0000,013C,0180,0800,0000,10A0 :2803 Z?
U 10A0, 0001,203D,0180,09E8,0000,11A8 :2804 =0 ERROR2,RC[OD]_Q
U 10A1, 0018,0038,0980,09F0,0000,10A2 :2805 RC[OE]_K[.2] : SET EXPECTED VALUE
U 10A2, 0000,003D,0180,0800,0000,11A5 :2806 =0 ERLOOP
U 10A3, 0810,0038,0180,0970,0000,12B5 :2807 D_RC[OE] : INIT THE CC'S
U 12B5, 0000,003C,3D80,3C00,0000,12B6 :2808 ID[PSL]_D : EXECUTE THE TEST INSTRUCTION
:2809 ;SYNC07: : READ C AND V
:2810 SET.PSL.C(AMX) : MASK
U 12B6, 0000,003C,0180,0800,0060,12B7 :2811 Q_ID[PSL] : CHECK
U 12B7, 0000,003C,3DF0,2C00,0000,12B8 :2812 Q_Q.AND.K[.3]
U 12B8, 0019,2034,0DC0,0800,0000,12B9 :2813 A[U_Q-D,CLK.UBCC,BYTE
U 12B9, 001D,A000,0180,0800,0010,12BA :2814 Z?
U 12BA, 0000,013C,0180,0800,0000,10A4 :2815 =0 ERROR2,RC[OD]_Q
U 10A4, 0001,203D,0180,09E8,0000,11A8 :2816 NOP
U 10A5, 0000,003C,0180,0800,0000,10A6 :2817

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ZZ-ESKAH-V132 TEST 140 COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)
ESKAH38.MCR MICRO2 1M(01) 16-DEC-82 12:24:52

:2818

SEQ 1028
Page 7

Z
E

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2819 .PAGE "TEST 141 CONDITION CODE LOAD = 3 (N AND Z BIT)"
2820 *****
2821 ++
2822 TEST 141 CONDITION CODE LOAD = 3 (N AND Z BIT)
2823
2824 TEST DESCRIPTION
2825 THIS TEST CHECKS THE N AND Z CONDITION CODES WITH A CONDITION
2826 CODE LOAD OF 3. FOR THIS UCCK FIELD VALUE, THE N BIT IS SET FROM
2827 THE AMUX SIGN SO THE N BIT IS CHECKED WITH DATA TYPE BYTE, WORD,
2828 AND LONG.
2829 THE Z BIT IS A FUNCTION OF ALU=0 AND THE CURRENT VALUE OF THE Z
2830 BIT SO, IT IS CHECKED WITH THE FOLLOWING 3 CONDITIONS:
2831 1) ALU=0 AND Z=1
2832 2) ALU=0 AND Z=0
2833 3) ALU.NE. 0 AND Z=1
2834
2835 SUBTST 1 - CHECK THAT THE N BIT SETS AND CLEARS WITH DATA TYPE
2836 BYTE, WORD, AND LONG.
2837 SUBTST 2 - CHECK THAT THE Z BIT SETS AND CLEARS CORRECTLY.
2838
2839 LOGIC DESCRIPTION
2840 THIS TEST CHECKS THE AMX SIGN MULTIPLEXOR AND PART OF THE Z AND
2841 N BIT DATA MULTIPLEXORS ON THE CEH MODULE.
2842
2843 ERROR DESCRIPTION
2844 DATA: EXPECTED CONDITION CODES
2845 RECEIVED CONDITION CODES
2846 LOOP COUNT
2847 SUBTST 1 - INDICATES WHETHER THE N BIT SHOULD BE SET OR CLEAR.
2848 SUBTST 2 - INDICATES WHICH OF THE ABOVE THREE CONDITIONS IS
2849 BEING TESTED, I.E. 3=COND 1, 2=COND 2, 1=COND 3
2850 DATA TYPE FLAG - 0=BYTE, 1=WORD, AND 2=LONG
2851
2852 SYNC POINT DESCRIPTION
2853 SUBTST 1 - SYNC08--LOAD THE N BIT DATA TYPE BYTE
2854 SYNC09--LOAD THE N BIT DATA TYPE WORD
2855 SYNC0A--LOAD THE N BIT DATA TYPE LONG
2856 SUBTST 2 - SYNC0B--LOAD THE Z BIT
2857 --
2858 *****
2859 =0
2860 T141: NEWTST[.4]
2861
2862
2863 :////////////////////
2864 :+
2865 :CHECK THE N BIT WITH DATA TYPE BYTE, WORD, AND LONG
2866 :-
2867
2868 T141S1: R[2] K[.8] : USED TO SET THE N BIT
2869 =0 SUBTEST
2870 D K[.40] : GENERATE ADDRESS OF EXPECTED DATA
2871 =0 CALL[DC0] : EQUAL 400(X)
2872 R[0] D
2873 RC[0E]_0 : INIT EXPECTED DATA
```

U 10A6, 0018,0039,1180,09F8,0000,1191

U 10A7, 0018,0038,0180,0A90,0000,10A8
U 10A8, 0000,003D,0180,0800,0000,11BF
U 10A9, 0818,0038,3180,0800,0000,10AA
U 10AA, 0000,003D,0180,0800,0000,11AA
U 10AB, 00C1,003C,0180,0A80,0000,12BB
U 12BB, 0003,003C,0180,09F0,0000,12BC

U 12BC.	0018.0038.0980.09E0.0000.12BD	:2874	RC[0C]_K[.2]	: SET THE LOOP COUNT
U 12BD.	0000.003C.0180.0A00.0200.12BE	:2875	T141L1: VA RC[0]	
U 12BE.	0003.003C.0180.09D8.0000.12BF	:2876	RC[0B]_0	: INIT DATA TYPE FLAG
U 12BF.	0000.003C.0180.0800.0000.12C0	:2877	D[LONG]_CACHE.P	: FETCH THE AMX DATA
U 12C0.	0001.003C.0180.0A88.0000.10AC	:2878	RC[1]_D	: SAVE
U 10AC.	0000.003D.0180.0800.0000.11A5	:2879	=0 ERLOOP	
U 10AD.	0800.003C.0180.0A10.0000.12C1	:2880	D RC[2]	
U 12C1.	0000.003C.3D80.3C00.0000.12C2	:2881	ID[PSL]_D	: INIT THE N BIT
U 12C2.	0810.0038.0180.0970.0000.12C3	:2882	D RC[0E]	: GET EXPECTED DATA
U 12C3.	0000.803C.0180.0A08.0030.12C5	:2883	SYNCO8: A[U RC[1]]_SET.N.AND.Z.BYTE	: EXECUTE THE TEST INSTRUCTION
U 12C5.	0000.003C.3DF0.2C00.0000.12C6	:2884	Q_ID[PSL]	: GET THE N BIT
U 12C6.	0019.2034.01C0.0800.0000.12C7	:2885	Q-Q.AND.K[.8]	: MASK IT
U 12C7.	001D.A000.0180.0800.0010.12C8	:2886	A[U_Q-D,CLK.UBCC,BYTE	: N BIT OK?
U 12C8.	0000.013C.0180.0800.0000.10AE	:2887	Z?	
U 10AE.	0001.203D.0180.09E8.0000.11A8	:2888	=0 ERROR2,RC[0D]_Q	
U 10AF.	0000.003C.0180.0A00.0000.12C9	:2889	LAB RC[0]	
U 12C9.	0018.0014.1180.0800.0200.12CA	:2890	VA [A+K[.4]	
U 12CA.	0000.003C.0180.0800.0C00.12CB	:2891	D[LONG]_CACHE.P	: GET AMX DATA FOR DT/WORD
U 12CB.	0018.0038.0580.09D8.0000.12CC	:2892	RC[0B]_RC[.1]	: SET THE DATA TYPE FLAG
U 12CC.	0001.003C.0180.0A88.0000.10B0	:2893	RC[1]_D	: SAVE
U 10B0.	0000.003D.0180.0800.0000.11A5	:2894	=0 ERLOOP	
U 10B1.	0800.003C.0180.0A10.0000.12CD	:2895	D RC[2]	: GET INIT VALUE FOR N BIT
U 12CD.	0000.003C.3D80.3C00.0000.12CE	:2896	ID[PSL]_D	: INIT THE N BIT
U 12CE.	0810.0038.0180.0970.0000.12CF	:2897	D RC[0E]	: GET THE EXPECTED VALUE
U 12CF.	0000.403C.0180.0A08.0030.12D0	:2898	SYNCO9: A[U RC[1]]_SET.N.AND.Z,WORD	: EXECUTE THE TEST INSTRUCTION
U 12D0.	0000.003C.3DF0.2C00.0000.12D1	:2899	Q_ID[PSL]	: GET THE N BIT
U 12D1.	0019.2034.01C0.0800.0000.12D2	:2900	Q-Q.AND.K[.8]	: MASK THE N BIT
U 12D2.	001D.A000.0180.0800.0010.12D3	:2901	A[U_Q-D,CLK.UBCC,BYTE	: OK?
U 12D3.	0000.013C.0180.0800.0000.10B2	:2902	Z?	
U 10B2.	0001.203D.0180.09E8.0000.11A8	:2903	=0 ERROR2,RC[0D]_Q	
U 10B3.	0000.003C.0180.0A00.0000.12D4	:2904	LAB RC[0]	
U 12D4.	0018.0014.0180.0800.0200.12D5	:2905	VA [A+K[.8]	
U 12D5.	0000.003C.0180.0800.0000.12D6	:2906	D[LONG]_CACHE.P	: FETCH AMX DATA FOR DT/LONG
U 12D6.	0018.0038.0980.09D8.0000.12D7	:2907	RC[0B]_RC[.2]	: SET THE DATA TYPE FLAG
U 12D7.	0001.003C.0180.0A88.0000.10B4	:2908	RC[1]_D	: SAVE
U 10B4.	0000.003D.0180.0800.0000.11A5	:2909	=0 ERLOOP	
U 10B5.	0800.003C.0180.0A10.0000.12D8	:2910	D RC[2]	: GET DATA TO INIT N BIT
U 12D8.	0000.003C.3D80.3C00.0000.12D9	:2911	ID[PSL]_D	: INIT THE N BIT
U 12D9.	0810.0038.0180.0970.0000.12DA	:2912	D RC[0E]	: GET EXPECTED VALUE OF N BIT
U 12DA.	0000.003C.0180.0A08.0030.12DB	:2913	SYNCOA: A[U RC[1]]_SET.N.AND.Z, LONG	: EXECUTE THE TEST INSTRUCTION
U 12DB.	0000.003C.3DF0.2C00.0000.12DC	:2914	Q_ID[PSL]	: GET THE N BIT
U 12DC.	0019.2034.01C0.0800.0000.12DD	:2915	Q-Q.AND.K[.8]	: MASK THE N BIT
U 12DD.	001D.A000.0180.0800.0010.12DE	:2916	A[U_Q-D,CLK.UBCC,BYTE	: N BIT OK?
U 12DE.	0000.013C.0180.0800.0000.10B6	:2917	Z?	
U 10B6.	0001.203D.0180.09E8.0000.11A8	:2918	=0 ERROR2,RC[0D]_Q	
U 10B7.	0000.003C.8580.0A00.0000.12DF	:2919	LAB RC[0],KMX/TC	: GET ADDRESS OF AMX DATA
U 12DF.	0018.0014.8580.0A80.0000.12E0	:2920	RC[0]_LA+K[.C]	: SET TO ADDRESS OF DATA TO SET N BIT
U 12E0.	0018.0038.0180.09F0.0000.12E1	:2921	RC[0E]_K[.8]	: SET EXPECTED VALUE OF N BIT
U 12E1.	0003.003C.0180.0A90.0000.12E2	:2922	RC[2]_0	: SET INIT VALUE OF N BIT
U 12E2.	0810.0038.0180.0960.0000.12E3	:2923	D RC[0C]	
U 12E3.	0019.8000.0580.09E0.0010.12E4	:2924	RC[0C]_D-K[.1],CLK.UBCC,BYTE	: DECREMENT THE LOOP COUNT
U 12E4.	0000.013C.0180.0800.0000.10B8	:2925	Z?	
U 10B8.	0000.003C.0180.0800.0000.12BD	:2926	=0 J/T141L1	
		:2927		
		:2928		

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:2929 :////////////////////
:2930 :
:2931 : UCCK FIELD=3, CHECK THE Z BIT
:2932 :-
:2933 :
U 10B9, 0018,0038,0D80,09E0,0000,10BA :2934 T141S2: RC[0C] K[.3] ; SET THE LOOP COUNT
U 10BA, 0003,003D,0180,0A80,0000,11BF :2935 =0 SUBTEST,R[0]_0
U 10BB, 0018,0038,1180,09F0,0000,10BC :2936 RC[0E] K[.4] ; SET EXPECTED VALUE OF Z BIT
U 10BC, 0000,003D,0D80,0800,0084,71C1 :2937 =0 SETRCF[.3]
U 10BD, 0018,0038,1180,0A88,0000,10BE :2938 RC[1] K[.4] ; SET THE INIT VALUE OF THE Z BIT
U 10BE, 0000,003D,0180,0800,0000,11A5 :2939 =0 ERLOOP
U 10BF, 0800,003C,0180,0A08,0000,12E5 :2940 T141L2: D R[1]
U 12E5, 0000,003C,3D80,3C00,0000,12E6 :2941 ID[PSL] D ; INIT THE Z BIT
U 12E6, 0810,0038,0180,0970,0000,12E7 :2942 D RC[0E] ; GET EXPECTED VALUE OF Z BIT
U 12E7, 0000,003C,0180,0A00,0030,12E8 :2943 SYNC0B: ACU R[0],SET.N.AND.Z ; EXECUTE THE TEST INSTRUCTION
U 12E8, 0000,003C,3DF0,2C00,0000,12E9 :2944 Q ID[PSL] ; GET THE Z BIT
U 12E9, 0019,2034,11C0,0800,0000,12EA :2945 Q-Q.AND.K[.4] ; MASK IT
U 12EA, 001D,A000,0180,0800,0010,12EB :2946 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 12EB, 0000,013C,0180,0800,0000,10C0 :2947 Z?
U 10C0, 0001,203D,0180,09E8,0000,11A8 :2948 =0 ERROR2,RC[0D]_Q
U 10C1, 0003,003C,0180,09F0,0000,12EC :2949 RC[0E]_0 ; SET THE NEXT EXPECTED VALUE
U 12EC, 0003,003C,0180,0A88,0000,12ED :2950 RC[1]_0 ; SET THE NEXT INIT VALUE
U 12ED, 0810,0038,0180,0960,0000,12EE :2951 D RC[0C] ; GET THE LOOP COUNT
U 12EE, 0019,8000,0980,0800,0010,12EF :2952 ACU_D-K[.2],CLK.UBCC,BYTE ; LOOP COUNT AT 2 YET?
U 12EF, 0000,013C,0180,0800,0000,10C2 :2953 Z? ; BRANCH IF YES
U 10C2, 0000,003C,0180,0800,0000,12F1 :2954 =0 J/T141P1 ; CONTINUE
U 10C3, 0018,0038,0580,0A80,0000,12F0 :2955 RC[0] K[.1] ; SET THE INIT Z DATA FOR THE LAST LOOP
U 12F0, 0018,0038,1180,0A88,0000,12F1 :2956 RC[1] K[.4] ; AND THE ALU DATA
U 12F1, 0019,8000,0580,09E0,0010,12F2 :2957 T141P1: RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 12F2, 0000,013C,0180,0800,0000,10C4 :2958 Z?
U 10C4, 0000,003C,0180,0800,0000,10BF :2959 =0 J/T141L2
U 10C5, 0000,003C,0180,0800,0000,10C6 :2960 NOP
:2961 :
:2962 :
:2963 : THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST (SUBTEST 1):
:2964 :X 400
:2965 : LOOP COUNT =2, DATA TYPE BYTE
:2966 :$ 8000,8000
:2967 : LOOP COUNT =2, DATA TYPE WORD
:2968 :$ 0080,8000
:2969 : LOOP COUNT =2, DATA TYPE LONG
:2970 :$ 8080,0000
:2971 : LOOP COUNT =1, DATA TYPE BYTE
:2972 :$ 0080,0000
:2973 : LOOP COUNT =1, DATA TYPE WORD
:2974 :$ 8000,0000
:2975 : LOOP COUNT =1, DATA TYPE LONG
:2976 :$ 0000,8000
:2977 :
:2978 :

```



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2979 .PAGE 'TEST 142 CONDITION CODE LOAD = 5 & 6 (N AND Z BIT)'
2980 *****
2981 **
2982 .TEST 142 CONDITION CODE LOAD = 5 & 6(N AND Z BIT)
2983
2984 .TEST DESCRIPTION
2985 .THIS TEST CHECKS THE N AND Z BITS WITH A CONDITION CODE LOAD
2986 .FUNCTION = 5 AND 6. THE Z BIT IS A FUNCTION OF ALU=0 FOR BOTH
2987 .OF THE CODITION CODE LOADS, SO IT IS TESTED WITH ALU=0
2988 .AND ALU.NE. 0.
2989 .THE N BIT IS A FUNCTION OF THE INVERTED ALU SIGN
2990 .XOR'D WITH THE SIGNAL 'INV ALU SIGN' FROM A ROM. THE INV ALU SIGN
2991 .SIGNAL IS ALWAYS LOW (FOR UCCK 5 & 6) SO THE N BIT BECOMES A
2992 .FUNCTION OF THE INVERTED ALU SIGN ONLY. THIS TEST THEN CHECKS THE
2993 .N BIT WITH THE ALU SIGN = TO 0 AND 1. SINCE THE ALU SIGN
2994 .IS A FUNCTION OF THE DATA TYPE, DATA TYPES BYTE, WORD, AND
2995 .LONG ARE TESTED. THE ALU DATA IS FETCHED FROM THE CACHE AND IS THE SAME
2996 .AS THE DATA USED IN THE PREVIOUS TEST.
2997
2998 .SUBTST 1 - CHECK THE Z BIT
2999 .SUBTST 2 - CHECK THE N BIT
3000
3001 .LOGIC DESCRIPTION
3002 .THIS TEST CHECKS THE MULTIPLEXORS AND ASSOCIATED COMBINATIONAL LOGIC
3003 .THAT FEED THE N AND Z DATA SIGNALS ON THE CEH MODULE, FOR CONDITION
3004 .CODE LOAD FUNCTIONS OF 5 AND 6.
3005
3006 .ERROR DESCRIPTION
3007 .DATA: EXPECTED CONDITION CODES
3008 .RECEIVED CONDITION CODES
3009 .LOOP COUNT - 2=N BIT SHOULD BE CLEAR, 1=N BIT SHOULD BE SET
3010 .DATA TYPE FLAG - 0=BYTE, 1=WORD, AND 2=LONG
3011
3012 .SYNC POINT DESCRIPTION
3013 .SUBTST 1 - SYNCOC--TRY AND CLEAR THE Z BIT, USSC=5
3014 .SYNCAD--TRY AND SET THE Z BIT, UCCK=5
3015 .SYNCAE--TRY AND SET THE Z BIT, UCCK=6
3016 .SYNCAF--TRY AND CLEAR THE Z BIT, UCCK=6
3017 .SUBTST 2 - SYNCA0--CLOCK THE N BIT, UCCK=5, DATA TYPE BYTE
3018 .SYNCA1--CLOCK THE N BIT, UCCK=6, DATA TYPE BYTE
3019 .SYNC12--CLOCK THE N BIT, UCCK=5, DATA TYPE WORD
3020 .SYNC13--CLOCK THE N BIT, UCCK=5, DATA TYPE LONG
3021 .--
3022 *****
3023 =0
3024 T142: NEWTST[.2]
3025 RC[OE]_0 ; SET EXPECTED RESULT
3026
3027 //////////////////////////////////////
3028 *
3029 UCCK FIELD =5. CHECK THE Z BIT
3030 :-
3031
3032 =0
3033 T142S1: SUBTEST
    
```

U 10C6, 0018,0039,0980,09F8,0000,1191
 U 10C7, 0003,003C,0180,09F0,0000,10C8

U 10C8, 0000,003D,0180,0800,0000,11BF

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U 10C9, 0000,003C,0180,0800,0000,10CA :3034 NOP
U 10CA, 0000,003D,0180,0800,0000,11A5 :3035 =0 ERLOOP
U 10CB, 0818,0038,1180,0800,0000,12F3 :3036 D K[.4] : INIT THE Z BIT
U 12F3, 0000,003C,3D80,3C00,0000,12F4 :3037 ID[PSL] D : GET THE EXPECTED DATA
U 12F4, 0810,0038,0180,0970,0000,12F5 :3038 D RC[OE] : EXECUTE THE TEST INSTRUCTION
U 12F5, 0018,0038,0580,0800,0050,12F6 :3039 SYNCOC: A[U K[.1],SET.N&Z : GET THE Z BIT
U 12F6, 0000,003C,3DF0,2C00,0000,12F7 :3040 Q ID[PSL] : MASK
U 12F7, 0019,2034,11C0,0800,0000,12F8 :3041 Q-Q.AND.K[.4] : CHECK
U 12F8, 001D,A000,0180,0800,0010,12F9 :3042 A[U_Q-D,CLK.UBCC,BYTE
U 12F9, 0000,013C,0180,0800,0000,10CC :3043 Z?
U 10CC, 0001,203D,0180,09E8,0000,11A8 :3044 =0 ERROR2,RC[OD]_Q
:3045
:3046 :+
:3047 : CHECK THAT Z BIT CLEARS WITH UCCK=6
:3048 :-
:3049
U 10CD, 0000,003C,0180,0800,0000,10CE :3050 NOP
U 10CE, 0000,003D,0180,0800,0000,11A5 :3051 =0 ERLOOP
U 10CF, 0818,0038,1180,0800,0000,12FA :3052 D K[.4]
U 12FA, 0000,003C,3D80,3C00,0000,12FB :3053 ID[PSL] D : INIT THE CC'S
U 12FB, 0810,0038,0180,0970,0000,12FC :3054 D RC[OE] : GET EXPECTED VALUE
U 12FC, 0018,0038,0580,0800,0060,12FD :3055 SYNCAD: A[U K[.1],SET.PSL.C(AMX) : EXECUTE THE TEST INSTRUCTION
U 12FD, 0000,003C,3DF0,2C00,0000,12FE :3056 Q ID[PSL] : GET THE Z BIT
U 12FE, 0019,2034,11C0,0800,0000,12FF :3057 Q-Q.AND.K[.4] : MASK
U 12FF, 001D,A000,0180,0800,0010,1300 :3058 A[U_Q-D,CLK.UBCC,BYTE : CHECK
U 1300, 0000,013C,0180,0800,0000,10D0 :3059 Z?
U 10D0, 0001,203D,0180,09E8,0000,11A8 :3060 =0 ERROR2,RC[OD]_Q
:3061
:3062 :+
:3063 : CHECK THAT Z BIT SETS WITH UCCK=5
:3064 :-
:3065
:3066
:3067 :+
:3068 : UCCK FIELD = 6, CHECK THE Z BIT
:3069 :-
:3070
U 10D1, 0018,0038,1180,09F0,0000,10D2 :3071 RC[OE]_K[.4] : INIT EXPECTED DATA
U 10D2, 0000,003D,0180,0800,0000,11A5 :3072 =0 ERLOOP
U 10D3, 0F00,003C,0180,0800,0000,1301 :3073 D 0
U 1301, 0000,003C,3D80,3C00,0000,1302 :3074 ID[PSL] D : INIT THE Z BIT
U 1302, 0810,0038,0180,0970,0000,1303 :3075 D RC[OE] : GET EXPECTED DATA
U 1303, 0003,003C,0180,0800,0050,1304 :3076 SYNCAE: A[U 0(A),SET.N&Z : EXECUTE THE TEST INSTRUCTION
U 1304, 0000,003C,3DF0,2C00,0000,1305 :3077 Q ID[PSL] : GET THE Z BIT
U 1305, 0019,2034,11C0,0800,0000,1306 :3078 Q-Q.AND.K[.4] : MASK
U 1306, 001D,A000,0180,0800,0010,1307 :3079 A[U_Q-D,CLK.UBCC,BYTE : CHECK
U 1307, 0000,013C,0180,0800,0000,10D4 :3080 Z?
U 10D4, 0001,203D,0180,09E8,0000,11A8 :3081 =0 ERROR2,RC[OD]_Q
:3082
:3083 :+
:3084 : CHECK THAT THE Z BIT SETS WITH UCCK=6
:3085 :-
:3086
U 10D5, 0000,003C,0180,0800,0000,10D6 :3087 NOP
U 10D6, 0000,003D,0180,0800,0000,11A5 :3088 =0 ERLOOP

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U 10D7, 0810,0038,0180,0970,0000,1308 :3089      D RC[OE]
U 1308, 0000,003C,3D80,3C00,0000,1309 :3090      ID[PSL] D      ; INIT THE CC'S
U 1309, 0810,0038,0180,0970,0000,130A :3091      D RC[OE]
U 130A, 0003,003C,0180,0800,0060,130B :3092      SYNCAF: ACU 0(A),SET.PSL.C(AMX)      ; EXECUTE THE TEST INSTRUCTION
U 130B, 0000,003C,3DF0,2C00,0000,130C :3093      Q ID[PSL]
U 130C, 0019,2034,11C0,0800,0000,130D :3094      Q-Q.AND.K[.4]      ; READ AND MASK THE Z BIT
U 130D, 001D,A000,0180,0800,0010,130E :3095      ACU_Q-D,CLK.UBCC,BYTE      ; CHECK
U 130E, 0000,013C,0180,0800,0000,10D8 :3096      Z?
U 10D8, 0001,203D,0180,09E8,0000,11A8 :3097      =0      ERROR2,RC[OD],Q
:3098
:3099
:3100      ;////////////////////
:3101      ;+
:3102      ; UCCK FIELD = 5 AND 6, N BIT DATA TYPE BYTE, WORD, AND LONG
:3103      ;-
:3104
U 10D9, 0018,0038,0180,0A90,0000,10DA :3105      T142S2: RC[2] K[.8]      ; USED TO SET THE N BIT
U 10DA, 0000,003D,0180,0800,0000,11BF :3106      =0      SUBTEST
U 10DB, 0818,0038,3180,0800,0000,10DC :3107      D K[.40]      ; GENERATE ADDRESS OF BMX DATA
U 10DC, 0000,003D,0180,0800,0000,11AA :3108      =0      CALL[DC0]      ; EQUAL 400(X)
U 10DD, 0001,003C,0180,0A80,0000,130F :3109      RC[0] D
U 130F, 0003,003C,0180,09F0,0000,10DE :3110      RC[OE] 0      ; INIT EXPECTED DATA
U 10DE, 0000,003D,1180,0800,0084,71C1 :3111      =0      SETRCF[.4]
U 10DF, 0018,0038,0980,09E0,0000,1310 :3112      RC[OC] K[.2]      ; SET THE LOOP COUNT
U 1310, 0000,003C,0180,0A00,0200,1311 :3113      T142L1: VA RC[0]
U 1311, 0000,003C,0180,C800,0000,1312 :3114      D[ONG]_CACHE.P      ; FETCH THE BMX DATA
U 1312, 0001,003C,0180,0988,0000,1313 :3115      RC[1] D      ; SAVE
U 1313, 0003,003C,0180,09D8,0000,10E0 :3116      RC[OB] 0      ; SET THE DATA TYPE FLAG
U 10E0, 0000,003D,0180,0800,0000,11A5 :3117      =0      ERLOOP
U 10E1, 0800,003C,0180,0A10,0000,1314 :3118      D RC[2]
U 1314, 0000,003C,3D80,3C00,0000,1315 :3119      ID[PSL] D      ; INIT THE N BIT
U 1315, 0810,0038,0180,0970,0000,1316 :3120      D RC[OE]      ; GET EXPECTED DATA
U 1316, 0010,8038,0180,0908,0050,1317 :3121      SYNCA0: ACU RC[1],SET.NBZ,BYTE      ; EXECUTE THE TEST INSTRUCTION
U 1317, 0000,003C,3DF0,2C00,0000,1318 :3122      Q ID[PSL]      ; GET THE N BIT
U 1318, 0019,2034,01C0,0800,0000,1319 :3123      Q-Q.AND.K[.8]      ; MASK IT
U 1319, 001D,A000,0180,0800,0010,131A :3124      ACU_Q-D,CLK.UBCC,BYTE      ; N BIT OK?
U 131A, 0000,013C,0180,0800,0000,10E2 :3125      Z?
U 10E2, 0001,203D,0180,09E8,0000,11A8 :3126      =0      ERROR2,RC[OD],Q
:3127
:3128      ;+
:3129      ; CHECK THAT N BIT CLEARS AND SETS WITH UCCK=6
:3130      ; NOTE: ONLY HAVE TO CHECK ONE OF THE DATA TYPES.
:3131      ;-
:3132
U 10E3, 0000,003C,0180,0800,0000,131B :3133      NOP
U 131B, 0018,0038,0580,09D8,0000,10E4 :3134      RC[OB]_K[.1]      ; SET THE DATA TYPE FLAG
U 10E4, 0000,003D,0180,0800,0000,11A5 :3135      =0      ERLOOP
U 10E5, 0800,003C,0180,0A10,0000,131C :3136      D RC[2]
U 131C, 0000,003C,3D80,3C00,0000,131D :3137      ID[PSL] D      ; INIT THE N BIT
U 131D, 0810,0038,0180,0970,0000,131E :3138      D RC[OE]      ; GET EXPECTED DATA
U 131E, 0010,8038,0180,0908,0060,131F :3139      SYNCA1: ACU RC[1],SET.PSL.C(AMX),BYTE      ; EXECUTE THE TEST
U 131F, 0000,003C,3DF0,2C00,0000,1320 :3140      Q ID[PSL]      ; READ THE N BIT
U 1320, 0019,2034,01C0,0800,0000,1321 :3141      Q-Q.AND.K[.8]      ; MASK
U 1321, 001D,A000,0180,0800,0010,1322 :3142      ACU_Q-D,CLK.UBCC,BYTE      ; CHECK
U 1322, 0000,013C,0180,0800,0000,10E6 :3143      Z?

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U 10E6, 0001,203D,0180,09E8,0000,11A8 :3144 =0 ERROR2,RC[0D]_Q ; N BIT FAILED
:3145
:3146
:3147 :+ CHECK THAT THE N BIT CLEARS AND SETS WITH DATA TYPE WORD
:3148 :-
:3149

U 10E7, 0000,003C,0180,0A00,0000,1323 :3150 LAB R[0]
U 1323, 0018,0014,1180,0800,0200,1324 :3151 VA [A+K[.4]
U 1324, 0000,003C,0180,C800,0000,1325 :3152 D[CONG]_CACHE.P ; GET BMX DATA FOR DT/WORD
U 1325, 0001,003C,0180,0988,0000,1326 :3153 RC[1] D ; SAVE
U 1326, 0018,0038,0980,09D8,0000,10E8 :3154 RC[0B]_K[.2] ; SET THE DATA TYPE FLAG
U 10E8, 0000,003D,0180,0800,0000,11A5 :3155 =0 ERLOOP
U 10E9, 0800,003C,0180,0A10,0000,1327 :3156 D R[2] ; GET INIT VALUE FOR N BIT
U 1327, 0000,003C,3D80,3C00,0000,1328 :3157 ID[PSL] D ; INIT THE N BIT
U 1328, 0810,0038,0180,0970,0000,1329 :3158 D RC[0E] ; GET THE EXPECTED VALUE
U 1329, 0010,4038,0180,0908,0050,132A :3159 SYNC12: ACU RC[1],SET.N&Z,WORD ; EXECUTE THE TEST INSTRUCTION
U 132A, 0000,003C,3DF0,2C00,0000,132B :3160 Q ID[PSL] ; GET THE N BIT
U 132B, 0019,2034,01C0,0800,0000,132C :3161 Q-Q.AND.K[.8] ; MASK THE N BIT
U 132C, 001D,A000,0180,0800,0010,132D :3162 ACU_Q-D,CLK.UBCC,BYTE ; OK?
U 132D, 0000,013C,0180,0800,0000,10EA :3163 Z?
U 10EA, 0001,203D,0180,09E8,0000,11A8 :3164 =0 ERROR2,RC[0D]_Q
:3165
:3166 :+ CHECK THAT THE N BIT CLEARS AND SETS WITH DATA TYPE LONG
:3167 :-
:3168
:3169

U 10EB, 0000,003C,0180,0A00,0000,132E :3170 LAB R[0]
U 132E, 0018,0014,0180,0800,0200,132F :3171 VA [A+K[.8]
U 132F, 0000,003C,0180,C800,0000,1330 :3172 D[CONG]_CACHE.P ; FETCH BMX DATA FOR DT/LONG
U 1330, 0001,003C,0180,0988,0000,10EC :3173 RC[1] D ; SAVE
U 10EC, 0000,003D,0180,0800,0000,11A5 :3174 =0 ERLOOP
U 10ED, 0800,003C,0180,0A10,0000,1331 :3175 D R[2] ; GET DATA TO INIT N BIT
U 1331, 0000,003C,3D80,3C00,0000,1332 :3176 ID[PSL] D ; INIT THE N BIT
U 1332, 0810,0038,0180,0970,0000,1333 :3177 D RC[0E] ; GET EXPECTED VALUE OF N BIT
U 1333, 0010,0038,0180,0908,0050,1334 :3178 SYNC13: ACU RC[1],SET.N&Z,LONG ; EXECUTE THE TEST INSTRUCTION
U 1334, 0000,003C,3DF0,2C00,0000,1335 :3179 Q ID[PSL] ; GET THE N BIT
U 1335, 0019,2034,01C0,0800,0000,1336 :3180 Q-Q.AND.K[.8] ; MASK THE N BIT
U 1336, 001D,A000,0180,0800,0010,1337 :3181 ACU_Q-D,CLK.UBCC,BYTE ; N BIT OK?
U 1337, 0000,013C,0180,0800,0000,10EE :3182 Z?
U 10EE, 0001,203D,0180,09E8,0000,11A8 :3183 =0 ERROR2,RC[0D]_Q
U 10EF, 0000,003C,8580,0A00,0000,1338 :3184 LAB_R[0],KMX/.C ; GET ADDRESS OF BMX DATA
:3185
:3186 :+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3187 :-
:3188
:3189

U 1338, 0018,0014,8580,0A80,0000,1339 :3190 RC[0] LA+K[.C] ; SET TO ADDRESS OF DATA TO SET N BIT
U 1339, 0018,0038,0180,09F0,0000,133A :3191 RC[0E] K[.8] ; SET EXPECTED VALUE OF N BIT
U 133A, 0003,003C,0180,0A90,0000,133B :3192 RC[2] 0 ; SET INIT VALUE OF N BIT
U 133B, 0810,0038,0180,0960,0000,133C :3193 D RC[0C]
U 133C, 0019,8000,0580,09E0,0010,133D :3194 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 133D, 0000,013C,0180,0800,0000,10F0 :3195 Z?
U 10F0, 0000,003C,0180,0800,0000,1310 :3196 =0 J/T142L1
U 10F1, 0000,003C,0180,0800,0000,10F2 :3197 NOP
:3198

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ZZ-ESKAH-V132
ESKAH38.MCR

TEST 142 CONDITION CODE LOAD = 5 8 6 (N AND Z BIT)
MICRO2 1M(01) 16-DEC-82 12:24:52

K 1

7

:3199

[illegible]

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3200 .PAGE "TEST 143 INSTRUCTION DEPENDENT COND CODE LOAD (C BIT)"
3201 *****
3202 ++
3203 TEST 143 CONDITION CODE LOAD=INSTRUCTION DEPENDENT-- C BIT
3204
3205 TEST DESCRIPTION
3206 THIS TEST LOADS THE INSTRUCTION BUFFER WITH THE APPROPRIATE OP
3207 CODES TO GENERATE "C SELECT" CODES OF 0, 1, 3, AND 5.
3208
3209 SUBTST 1 - CHECK C SELECT CODE OF 0 BY SETTING AND CLEARING THE
3210 C BIT AND ENSURING IT REMAINS UNCHANGED.
3211 SUBTST 2 - CHECK C SELECT CODE OF 1 FOR DATA TYPES OF BYTE, WORD,
3212 AND LONG WITH ALU CARRY TRUE AND FALSE FOR EACH
3213 DATA TYPE.
3214 SUBTST 3 - CHECK C SELECT CODE OF 3 BY SETTING THE C BIT AND
3215 ENSURING THAT IT CLEARS.
3216 SUBTST 4 - CHECK C SELECT CODE OF 5 WITH ALU CARRY TRUE AND ALU
3217 CARRY FALSE.
3218
3219 LOGIC DESCRIPTION
3220 THIS TEST CHECKS THE VAX CONDITION CODE INSTRUCTION DEPENDENT
3221 PROM, AND THE CV SEL PROM (C SEL OUTPUTS), THE MULTIPLEXOR
3222 FOR THE ALU CARRY BIT, AND PART OF THE MULTIPLEXOR FOR THE C DATA
3223 SIGNAL.
3224
3225 ERROR DESCRIPTION
3226 DATA: EXPECTED C BIT
3227 RECEIVED C BIT
3228 LOOP COUNT - SUBTST 2 ONLY -- INDICATES THE VALUE OF THE
3229 ALU CARRY BIT, I.E. 6=FALSE & DT/BYTE, 5=FALSE & DT/WORD,
3230 4=FALSE & DT/LONG, 3=TRUE & DT/BYTE, 2=TRUE & DT/WORD
3231 1=TRUE & DT/LONG.
3232
3233 SYNC POINT DESCRIPTION
3234 SUBTST 1 - SYNC14--C BIT SHOULD BE CLEAR AND STAY CLEAR
3235 SYNC15--C BIT SHOULD BE SET AND STAY SET
3236 SUBTST 2 - SYNC16--C BIT GETS LOADED
3237 SUBTST 3 - SYNC17--C BIT SHOULD CLEAR
3238 SUBTST 4 - SYNC18--C BIT SHOULD CLEAR
3239 SYNC19--C BIT SHOULD SET
3240
3241 --
3242 *****
3243 =0
3244 T143: NEWTST[.2]
3245
3246 ;////////////////////////////////////
3247 +
3248 ; C SELECT<2:0>=HHH C_PSL C
3249 -
3250
3251 T143S1: RC[OE] 0 ; INIT EXP VALUE OF C BIT
3252 =0 SUBTEST
3253 D_K[.18] ; INIT ADDRESS OF IB DATA
3254 ST_K[.A]
3255 RETJ_D.ORNOT.MASK ; EQUALS 418(X)
    
```

U 10F2, 0018,0039,0980,09F8,0000,1191

U 10F3, 0003,003C,0180,09F0,0000,10F4
 U 10F4, 0000,003D,0180,0800,0000,11BF
 U 10F5, 0818,0038,7D80,0800,0000,133E
 U 133E, 0000,003C,F580,0800,0084,733F
 U 133F, 0001,001C,0180,0A88,0000,10F6

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U 10F6, 2000,003D,0180,0A08,4200,11DF :3255
U 10F7, 0000,003C,0180,0800,0000,10F8 :3256 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F8, 0000,003D,0180,0800,0000,11A5 :3257 NOP
U 10F9, 0810,0038,0180,0970,0000,1340 :3258 =0 ERLOOP
U 1340, 0000,003C,3DF0,2C00,0000,1341 :3259 D_RC[OE] ; GET EXPECTED VALUE
U 1341, 0019,2024,61C0,0800,0000,1342 :3260 Q_ID[PSL]
U 1342, 081D,0030,0180,0800,0000,1343 :3261 Q-Q.ANDNOT.K[F]
U 1343, 0000,003C,3D80,3C00,0000,1344 :3262 D-D.OR.Q
U 1344, 0000,C03C,0180,0800,0070,1345 :3263 ID[PSL] D ; LOAD THE C BIT
U 1345, 0000,003C,3DF0,2C00,0000,1346 :3264 SYNC14: SET.CC(INST) ; EXECUTE THE INSTRUCTION UNDER TEST
U 1346, 0019,2034,05C0,0800,0000,1347 :3265 Q_ID[PSL] ; GET THE C BIT
U 1347, 001D,A000,0180,0800,0010,1348 :3266 Q-Q.AND.K[.1] ; MASK
U 1348, 0000,013C,0180,0800,0000,10FA :3267 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 10FA, 0001,203D,0180,09E8,0000,11A8 :3268 Z?
U 10FB, 0018,0038,0580,09F0,0000,1349 :3269 =0 ERROR2,RC[OD],Q
U 1349, 0810,0038,0180,0970,0000,134A :3270 RC[OE] K[.1] ; SET EXP VALUE OF C BIT
U 134A, 0000,003C,3DF0,2C00,0000,134B :3271 D_RC[OE] ; LOAD THE C BIT
U 134B, 0019,2024,61C0,0800,0000,134C :3272 Q_ID[PSL]
U 134C, 081D,0030,0180,0800,0000,134D :3273 Q-Q.ANDNOT.K[F]
U 134D, 0000,003C,3D80,3C00,0000,134E :3274 D-D.OR.Q
U 134E, 0000,C03C,0180,0800,0070,134F :3275 ID[PSL] D ;
U 134F, 0000,003C,3DF0,2C00,0000,1350 :3276 SYNC15: SET.CC(INST) ; EXECUTE THE TEST INSTRUCTION
U 1350, 0019,2034,05C0,0800,0000,1351 :3277 Q_ID[PSL] ; GET THE C BIT
U 1351, 001D,A000,0180,0800,0010,1352 :3278 Q-Q.AND.K[.1] ; MASK
U 1352, 0000,013C,0180,0800,0000,10FC :3279 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 10FC, 0001,203D,0180,09E8,0000,11A8 :3280 Z?
:3281 =0 ERROR2,RC[OD],Q
:3282
:3283
:3284 :////////////////////
:3285 :+
:3286 : C SELECT<2:0>=HHL C_ALU CARRY L
:3287 :-
:3288
U 10FD, 0000,003C,0180,0800,0000,10FE :3289 NOP
U 10FE, 0000,003D,0180,0800,0000,11BF :3290 =0
U 10FF, 0000,003C,0180,0800,0000,110A :3291 T143S2: SUBTEST
U 110A, 0000,003D,0D80,0800,0084,71C1 :3292 NOP
U 110B, 0000,003C,8D80,0800,0084,7353 :3293 =0 SETRCF[.3]
U 1353, 0803,0010,4580,0800,0000,1354 :3294 SC_K[.1F] ; GENERATE DATA PATTERN TO
U 1354, 0819,0014,4580,0800,0000,1355 :3295 D_MASK+1,KMX/.8000 ; CAUSE CARRYS IN ALL FOUR BYTES
U 1355, 0819,0030,4180,0800,0000,1356 :3296 D-D+K[.8000] ; ...
U 1356, 0001,003C,F580,0990,0084,7357 :3297 D-D.OR.K[.80]
U 1357, 0803,001C,0180,0800,0000,1358 :3298 RC[2] D,SC_K[A] ; SAVE IN RC 2
U 1358, 0019,0030,E580,0A88,0000,1359 :3299 D NOT MASK
U 1359, 0019,0030,7980,0A80,0000,135A :3300 R[1] D.OR.K[.1A] ; INIT ADR OF IB DATA
U 135A, 0018,0038,0580,0A98,0000,135B :3301 R[0] D.OR.K[.30] ; INIT ADR OF AMX DATA
U 135B, 0018,0038,D580,09E0,0000,135C :3302 R[3] K[.1] ; VALUE TO INIT THE C BIT
U 135C, 0003,003C,0180,09F0,0000,135D :3303 RC[OE] K[.6] ; SET THE LOOP COUNT
:3304 RC[OE] 0 ; INIT EXP VALUE OF C BIT
:3305
U 135D, 0000,003C,0180,0A00,0200,135E :3306 T143L1: VA_R[0]
U 135E, 0000,003C,0180,C800,0000,135F :3307 D[CONG]_CACHE.P ; FETCH AMX DATA
U 135F, 0001,003C,0180,0A90,0000,1110 :3308 R[2] D ; SAVE IN R2
U 1110, 2000,003D,0180,0A08,4200,11DF :3309 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
    
```

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U 1111, 0000,003C,0180,0800,0000,1112 :3310 NOP
U 1112, 0000,003D,0180,0800,0000,11C4 :3311 =0 CALL,J/DISPAT ; LOAD THE DATA TYPE LATCH
U 1113, 0000,003C,0180,0800,0000,1114 :3312 NOP
U 1114, 0000,003D,0180,0800,0000,11A5 :3313 =0 ERLOOP
U 1115, 0800,003C,0180,0A18,0000,1360 :3314 D_R[3] ; INIT THE C BIT
U 1360, 0000,003C,3DF0,2C00,0000,1361 :3315 Q_ID[PSL]
U 1361, 0019,2024,61C0,0800,0000,1362 :3316 Q_Q.ANDNOT.K[F]
U 1362, 081D,0030,0180,0800,0000,1363 :3317 D_D.OR.Q
U 1363, 0000,003C,3D80,3E10,0000,1364 :3318 ID[PSL] D.LAB_R[2]
U 1364, 0810,0038,0180,0970,0000,1365 :3319 D_RC[OE] ; GET EXP VALUE
U 1365, 0000,003C,0180,0910,0000,1366 :3320 LC_RC[2] ; LATCH BMX DATA
U 1366, 0010,C014,0180,0800,0070,1367 :3321 SYNC16: ALU_LA+LC,SET.CC(INST) ; EXECUTE TEST FUNCTION
U 1367, 0000,003C,3DF0,2C00,0000,1368 :3322 Q_ID[PSL] ; GET THE C BIT
U 1368, 0019,2034,05C0,0800,0000,1369 :3323 Q_Q.AND.K[1] ; MASK
U 1369, 001D,A000,0180,0800,0010,136A :3324 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 136A, 0000,013C,0180,0800,0000,1116 :3325 Z?
U 1116, 0001,203D,0180,09E8,0000,11A8 :3326 =0 ERROR2,RC[OD],Q
:3327
:3328 ;+
:3329 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUB TEST
:3330 ; -
:3331
U 1117, 0000,003C,0180,0A00,0000,136B :3332 LAB_R[0]
U 136B, 0018,0014,1180,0A80,0000,136C :3333 R[0] LA+K[.4] ; INCREMENT ADR OF AMX DATA
U 136C, 0000,003C,0180,0A08,0000,136D :3334 LAB_R[1]
U 136D, 0C18,0014,1180,0A88,0000,136E :3335 R[1] LA+K[.4] ; INCREMENT ADR OF IB DATA
U 136E, 0810,0038,0180,0960,0000,136F :3336 D_RC[OC] ; GET THE LOOP COUNT
U 136F, 0019,8000,1180,0800,0010,1370 :3337 ALU_D-K[.4],CLK.UBCC,BYTE ; TIME FOR COMPLIMENT CARRY BIT?
U 1370, 0000,013C,F580,0800,0084,7118 :3338 Z?,SC_K[A] ; BRANCH IF YES
U 1118, 0000,003C,0180,0800,0000,1374 :3339 =0 J/T143P1
U 1119, 0803,001C,0180,0800,0000,1371 :3340 D_NOT.MASK ; RESET THE ADDRESS OF IB DATA
U 1371, 0019,0030,E580,0A88,0000,1372 :3341 R[1] D.OR.K[.1A]
U 1372, 0003,003C,0180,0A98,0000,1373 :3342 R[3] 0 ; SET INIT VALUE OF C BIT
U 1373, 0018,0038,0580,09F0,0000,1374 :3343 RC[OE] K[.1] ; SET EXPECTED VALUE OF C BIT
U 1374, 0810,0038,0180,0960,0000,1375 :3344 T143P1: D_RC[OC] ; GET THE LOOP COUNT
U 1375, 0019,8000,0580,09E0,0010,1376 :3345 R[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 1376, 0000,013C,0180,0800,0000,111A :3346 Z?
U 111A, 0000,003C,0180,0800,0000,135D :3347 =0 J/T143L1
:3348
:3349
:3350 ;////////////////////
:3351 ;+
:3352 ; C SELECT<2:0>=HLL C_0
:3353 ; -
:3354
U 111B, 0003,003C,0180,09F0,0000,111C :3355 T143S3: RC[OE] 0 ; INIT EXP VALUE OF C BIT
U 111C, 0000,003D,0180,0800,0000,11BF :3356 =0 SUBTEST
U 111D, 0000,003C,0180,0800,0000,111E :3357 NOP
U 111E, 0000,003D,0980,0800,0084,71C1 :3358 =0 SETRCF[.2]
U 111F, 0000,003C,0180,0800,0000,1120 :3359 NOP
U 1120, 2000,003D,0180,0A08,4200,11DF :3360 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1121, 0000,003C,0180,0800,0000,1122 :3361 NOP
U 1122, 0000,003D,0180,0800,0000,11A5 :3362 =0 ERLOOP
U 1123, 0818,0038,0580,0800,0000,1377 :3363 D_K[.1]
U 1377, 0000,003C,3DF0,2C00,0000,1378 :3364 Q_ID[PSL]

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U 1378, 0019,2024,61C0,0800,0000,1379 :3365      Q_Q.ANDNOT.K[F]
U 1379, 081D,0030,0180,0800,0000,137A :3366      D_D.OR.Q
U 137A, 0000,003C,3D80,3C00,0000,137B :3367      ID[PSL] D
U 137B, 0000,003C,0180,0800,0070,137C :3368      SYNC17: SET.CC(INST)
U 137C, 0000,003C,3DF0,2C00,0000,137D :3369      Q_ID[PSL]
U 137D, 0019,2034,05C0,0800,0000,137E :3370      Q_Q.AND.K[1]
U 137E, 081D,0038,0180,0970,0000,137F :3371      D_RC[OE]
U 137F, 001D,A000,0180,0800,0010,1380 :3372      ALU_Q-D,CLK.UBCC,BYTE
U 1380, 0000,013C,0180,0800,0000,1124 :3373      Z?
U 1124, 0001,203D,0180,09E8,0000,11A8 :3374      =0      ERROR2,RC[OD],Q
:3375
:3376
:3377      :////////////////////
:3378      :+
:3379      : C SELECT<2:0>=LHL    C_ALU CARRY H
:3380      :-
:3381
U 1125, 0000,003C,0180,0A08,0000,1126 :3382      T143S4: LAB RC[1]
U 1126, 0000,003D,0180,0800,0000,11BF :3383      =0      SUBTEST
U 1127, 0018,0014,0980,0A88,0000,1381 :3384      RC[1] LA+K[2]
U 1381, 0003,003C,0180,09F0,0000,1128 :3385      RC[OE] 0
U 1128, 2000,003D,0180,0A08,4200,11DF :3386      =0      ALU_RET],FLUSH.IB,CALL,J/IBWAIT
U 1129, 0000,003C,0180,0800,0000,112A :3387      NOP
U 112A, 0000,003D,0180,0800,0000,11C4 :3388      =0      CALL,J/DISPAT
U 112B, 0000,003C,0180,0800,0000,112C :3389      NOP
U 112C, 0000,003D,0180,0800,0000,11A5 :3390      =0      ERLOOP
U 112D, 0818,0038,0580,0800,0000,1382 :3391      D_K[1]
U 1382, 0000,003C,3DF0,2C00,0000,1383 :3392      Q_ID[PSL]
U 1383, 0019,2024,61C0,0800,0000,1384 :3393      Q_Q.ANDNOT.K[F]
U 1384, 081D,0030,0180,0800,0000,1385 :3394      D_D.OR.Q
U 1385, 0000,003C,3D80,3C00,0000,1386 :3395      ID[PSL] D
U 1386, 081D,0038,0180,0970,0000,1387 :3396      D_RC[OE]
U 1387, 0018,0038,49C0,0800,0000,1388 :3397      Q_K[FF]
U 1388, 0019,E014,0580,0800,0070,1389 :3398      SYNC18: ALU_Q+K[1],SET.CC(INST)
U 1389, 0000,003C,3DF0,2C00,0000,138A :3399      Q_ID[PSL]
U 138A, 0019,2034,05C0,0800,0000,138B :3400      Q_Q.AND.K[1]
U 138B, 001D,A000,0180,0800,0010,138C :3401      ALU_Q-D,CLK.UBCC,BYTE
U 138C, 0000,013C,0180,0800,0000,112E :3402      Z?
U 112E, 0001,203D,0180,09E8,0000,11A8 :3403      =0      ERROR2,RC[OD],Q
U 112F, 0018,0038,0580,09F0,0000,1130 :3404      RC[OE],K[1]
U 1130, 0000,003D,0180,0800,0000,11A5 :3405      =0      ERLOOP
U 1131, 0F00,003C,0180,0800,0000,138D :3406      D_0
U 138D, 0000,003C,3DF0,2C00,0000,138E :3407      Q_ID[PSL]
U 138E, 0019,2024,61C0,0800,0000,138F :3408      Q_Q.ANDNOT.K[F]
U 138F, 081D,0030,0180,0800,0000,1390 :3409      D_D.OR.Q
U 1390, 0000,003C,3D80,3C00,0000,1391 :3410      ID[PSL] D
U 1391, 081D,0038,01F8,0970,0000,1392 :3411      D_RC[OE],Q 0
U 1392, 0019,E014,0580,0800,0070,1393 :3412      SYNC19: ALU_Q+K[1],SET.CC(INST)
U 1393, 0000,003C,3DF0,2C00,0000,1394 :3413      Q_ID[PSL]
U 1394, 0019,2034,05C0,0800,0000,1395 :3414      Q_Q.AND.K[1]
U 1395, 001D,A000,0180,0800,0010,1396 :3415      ALU_Q-D,CLK.UBCC,BYTE
U 1396, 0000,013C,0180,0800,0000,1132 :3416      Z?
U 1132, 0001,203D,0180,09E8,0000,11A8 :3417      =0      ERROR2,RC[OD],Q
U 1133, 0000,003C,0180,0800,0000,1134 :3418      NOP
:3419

```

```
:3420  
:3421 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:  
:3422 :% 418  
:3423 : SUBTST 1  
:3424 :$ 0000  
:3425 : SUBTST 2 -- LOOP COUNT = 6 & 3  
:3426 :$ 5080,0050  
:3427 : SUBTST 2 -- LOOP COUNT = 5 & 2  
:3428 :$ 50A0,0050  
:3429 : SUBTST 2 -- LOOP COUNT = 4 & 1  
:3430 :$ 50C0,0050  
:3431 : SUBTST 3  
:3432 :$ 5028  
:3433 : SUBTST 4  
:3434 :$ 5082  
:3435 :  
:3436 : FOLLOWING IS THE AMX DATA FOR SUB TEST 2:  
:3437 : EACH PASS THRU THE LOOP USES A LONG WORD  
:3438 : NO CARRY GENERATED  
:3439 :% 430  
:3440 :$ FF00,FFFF  
:3441 :$ 00FF,FFFF  
:3442 :$ FFFF,0000  
:3443 : CARRY GENERATED  
:3444 :$ 00FF,0000  
:3445 :$ FF00,0000  
:3446 :$ 0000,FFFF  
:3447
```

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3448 PAGE "TEST 144 INSTRUCTION DEPENDENT COND CODE LOAD (V BIT)"
3449 *****
3450 ++
3451 TEST 144 INSTRUCTION DEPENDENT V BIT
3452
3453 TEST DESCRIPTION
3454 THIS TEST CHECKS V SELECT VALUES OF 0, 5, AND 6 WITH SELECTED
3455 OP CODES AND DATA PATTERNS TO CHECK THE LOGIC ASSOCIATED WITH
3456 THESE VALUES OF THE V SELECT SIGNALS.
3457
3458 SUBTST 1 - CHECK V SELECT 0 AND THOSE DATA PATTERNS REQUIRING THE
3459 ALU TO EXECUTE AN AMX+BMX TO GENERATE THE REQUIRED ALU
3460 DATA.
3461 SUBTST 2 - CHECK V SELECT 0 AND THOSE DATA PATTERNS REQUIRING THE
3462 ALU TO EXECUTE AN AMX.AND.BMX TO GENERATE THE REQUIRED
3463 ALU DATA.
3464 SUBTST 3 - CHECK V SELECT 0 WITH THE "INV BMX SIGN" SIGNAL FALSE
3465 IN DATA TYPE BYTE AND LONG. ALU FUNCTION IS AMX+BMX
3466 TO GENERATE THE CORRECT ALU DATA.
3467 SUBTST 4 - CHECK V SELECT 0 WITH THE "INV BMX SIGN" SIGNAL FALSE
3468 IN DATA TYPE BYTE AND LONG. ALU FUNCTION IS AMX.AND.BMX
3469 TO GENERATE THE CORRECT ALU DATA.
3470 SUBTST 5 - CHECK V SELECT 5. THE V DETECT SW IS ALWAYS DEASSERTED
3471 FOR THIS SELECT CODE IN VAX MODE.
3472 SUBTST 6 - CHECK V SELECT 6 WITH V DETECT SW TRUE. CHECKS THE FUNCTION
3473 WITH 3 VALUES OF EALU<9:8>, I.E. 01,11, AND 00.
3474 SUBTST 7 - CHECK V SELECT 6 WITH V DETECT SW FALSE. BOTH ALU=0
3475 AND ALU.NE.0 ARE CHECKED.
3476
3477 LOGIC DESCRIPTION
3478 THIS TEST CHECKS MORE OF THE INSTRUCTION DEPENDENT CONDITION CODE
3479 PROM, THE V SELECT OUTPUTS OF THE CV PROM, PART OF THE
3480 V SELECT ENCODER, AND SOME OF THE COMBINATIONAL LOGIC THAT GENERATES
3481 THE V DATA SIGNAL.. ON THE CEH MODULE.
3482
3483 ERROR DESCRIPTION
3484 DATA: EXPECTED CONDITION CODES
3485 RECEIVED CONDITION CODES
3486 LOOP COUNT -- INDICATES WHICH DATA PATTERN IS BEING USED
3487 TO GENERATE THE V DATA SIGNAL.
3488 NOT USED IN SUB TEST 5.
3489
3490 SYNC POINT DESCRIPTION
3491 SUBTST 1 - SYNC9F--V BIT IS LOADED
3492 SUBTST 2 - SYNC1A--V BIT IS CLOCKED
3493 SUBTST 3 - SYNC1B--V BIT IS CLOCKED
3494 SUBTST 4 - SYNC1C--V BIT IS CLOCKED
3495 SUBTST 5 - SYNC1D--V BIT IS CLOCKED
3496 SUBTST 6 - SYNC1E--V BIT IS CLOCKED
3497 SUBTST 7 - SYNC1F--V BIT IS CLOCKED
3498
3499 *****
3500 =0
3501 T144: NEWTST[.3]
3502 D_K[.40] ; GENERATE ADDRESS OF IB DATA
    
```

U 1134, 0018,0039,0D80,09F8,0000,1191
 U 1135, 0818,0038,3180,0800,0000,1136

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U 1136. 0000,003D,0180,0800,0000,11AA :3503 =0 CALL[DC0] : AND AMUX DATA
U 1137. 0019,0030,35C0,0A88,0000,1397 :3504 R[1]_D.OR.K[.50],Q.ALU : EQUALS 450(X) IB DATA
U 1397. 0019,2030,7580,0A90,0000,1398 :3505 R[2]_ALU,ALU Q.OR.R[.20] : EQUALS 470(X) AMX DATA
U 1398. 0819,0030,2580,0800,0000,1399 :3506 D.D.OR.K[.A0]
U 1399. 0019,0030,6580,0A98,0000,139A :3507 R[3]_D.OR.K[.10] : SET ADR OF BMX DATA = 480(X)
U 139A. 0019,0030,3180,0AA0,0000,139B :3508 R[4]_D.OR.K[.40] : GEN ADR OF EXP V BIT= 4E0(X)
:3509
:3510 :////////////////////
:3511 :+
:3512 : VSEL=0---CONDITIONS REQUIRING THE ALU TO DO AN AMX PLUS BMX TO
:3513 : GENERATE THE CORRECT ALU DATA
:3514 :-
:3515
U 139B. 0818,0038,1180,0800,0000,139C :3516 T144S1: D.K[.4]
U 139C. 0019,0014,0580,09E0,0000,1138 :3517 R[0C]_D+K[.1] : SET THE LOOP COUNT
U 1138. 0000,003D,0180,0800,0000,11BF :3518 =0 SUBTEST
U 1139. 0000,003C,0180,0800,0000,113A :3519 NOP
:3520 =0
U 113A. 0000,003D,0180,0800,0000,11C6 :3521 T144L1: CALL,J/GETDATA : FECH THE AMX, BMX, AND EXP DATA
U 113B. 0000,003C,0180,0800,0000,113C :3522 NOP
U 113C. 0000,003D,0180,0800,0000,11A5 :3523 =0 ERLOOP
U 113D. 0000,003C,0180,0800,0000,113E :3524 NOP
U 113E. 0000,003D,0180,0800,0000,11CF :3525 =0 CALL,J/INITVBIT : SET V BIT TO COMPLIMENT OF EXPECTED
U 113F. 0010,C014,0180,0800,0070,139D :3526 SYNC9F: ALU LA+LC,SET.CC(INST) : EXECUTE THE TEST
U 139D. 0000,003C,3DF0,2C00,0000,139E :3527 Q_ID[PSL] : GET THE V BIT
U 139E. 0019,2034,09C0,0800,0000,139F :3528 Q-Q.AND.K[.2] : MASK
U 139F. 001D,A000,0180,0800,0010,13A0 :3529 ALU_Q-D,CLK.UBCC,BYTE : CHECK
U 13A0. 0000,013C,0180,0800,0000,1140 :3530 Z?
U 1140. 0001,203D,0180,09E8,0000,11A8 :3531 =0 ERROR2,R[0D]_Q
:3532
:3533 :+
:3534 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3535 :-
:3536
U 1141. 0000,003C,0180,0A10,0000,13A1 :3537 LAB R[2]
U 13A1. 0018,0014,1180,0A90,0000,13A2 :3538 R[2]_LA+K[.4] : INCREMENT ADR OF AMX DATA
U 13A2. 0000,003C,0180,0A18,0000,13A3 :3539 LAB R[3]
U 13A3. 0018,0014,1180,0A98,0000,13A4 :3540 R[3]_LA+K[.4] : AND BMX DATA
U 13A4. 0000,003C,0180,0A20,0000,13A5 :3541 LAB R[4]
U 13A5. 0018,0014,0580,0AA0,0000,13A6 :3542 R[4]_LA+K[.1] : AND EXPECTED DATA
U 13A6. 0810,0038,0180,0960,0000,13A7 :3543 D.R[0C]
U 13A7. 0019,8000,0580,09E0,0010,13A8 :3544 R[0C]_D-K[.1],CLK.UBCC,BYTE : CHECK LOOP COUNT
U 13A8. 0000,013C,0180,0800,0000,1142 :3545 Z?
U 1142. 0000,003C,0180,0800,0000,113A :3546 =0 J/T144L1
:3547
:3548
:3549 :////////////////////
:3550 :+
:3551 : VSELECT=0---AMX AND BMX PATTERNS THAT REQUIRE THE ALU TO DO AN AMX .AND.
:3552 : BMX TO GET THE CORRECT ALU DATA
:3553 :-
:3554
U 1143. 0018,0038,0D80,09E0,0000,1144 :3555 T144S2: R[0C] K[.3] : SET THE LOOP COUNT
U 1144. 0000,003D,0180,0800,0000,11BF :3556 =0 SUBTEST
U 1145. 0000,003C,0180,0800,0000,1146 :3557 NOP

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:3558
U 1146, 0000,003D,0180,0800,0000,11C6 :3559 =0 T144L2: CALL,J/GETDATA ; GET AMX, BMX, AND EXP DATA
U 1147, 0000,003C,0180,0800,0000,1148 :3560 NOP
U 1148, 0000,003D,0180,0800,0000,11A5 :3561 =0 ERLOOP
U 1149, 0000,003C,0180,0800,0000,114A :3562 NOP
U 114A, 0000,003D,0180,0800,0000,11CF :3563 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
U 114B, 0010,C034,0180,0800,0070,13A9 :3564 SYNC1A: ALU LA,AND,LC,SET.CC(INST) ; EXECUTE THE TEST
U 13A9, 0000,003C,3DF0,2C00,0000,13AA :3565 Q_ID[PSL]
U 13AA, 0019,2034,09C0,0800,0000,13AB :3566 Q-Q.AND,K[.2] ; MASK RECEIVED V BIT
U 13AB, 001D,A000,0180,0800,0010,13AC :3567 A[U-Q-D,CLK,UBCC,BYTE] ; CHECK
U 13AC, 0000,013C,0180,0800,0000,114C :3568 Z?
U 114C, 0001,203D,0180,09E8,0000,11AB :3569 =0 ERROR2,RC[OD],Q
U 114D, 0000,003C,0180,0A10,0000,13AD :3570 LAB R[2]
U 13AD, 0018,0014,1180,0A90,0000,13AE :3571 R[2] LA+K[.4] ; INCREMENT ADR OF AMX DATA
U 13AE, 0000,003C,0180,0A18,0000,13AF :3572 LAB R[3]
U 13AF, 0018,0014,1180,0A98,0000,13B0 :3573 R[3] LA+K[.4] ; AND BMX DATA
U 13B0, 0000,003C,0180,0A20,0000,13B1 :3574 LAB R[4]
U 13B1, 0018,0014,0580,0AA0,0000,13B2 :3575 R[4] LA+K[.1] ; AND EXPECTED DATA
U 13B2, 0810,0038,0180,0960,0000,13B3 :3576 D RC[OC]
U 13B3, 0019,8000,0580,09E0,0010,13B4 :3577 RC[OC],D-K[.1],CLK,UBCC,BYTE ; CHECK LOOP COUNT
U 13B4, 0000,013C,0180,0800,0000,114E :3578 Z?
U 114E, 0000,003C,0180,0800,0000,1146 :3579 =0 J/T144L2
:3580
:3581
:3582 ;////////////////////
:3583 ;+
:3584 ; VSELECT=0 * INV BMX SIGN IS FALSE. FIRST TIME THRU LOOP IS DATA TYPE
:3585 ; BYTE, SECOND TIME IS DATA TYPE LONG. ALU FUNCTION IS AMX PLUS BMX
:3586 ; -
:3587
U 114F, 0000,003C,0180,0A08,0000,13B5 :3588 T144S3: LAB R[1]
U 13B5, 0018,0014,1180,0A88,0000,1150 :3589 R[1] LA+K[.4] ; INCRMENT ADR OF IB DATA
U 1150, 0000,003D,0180,0800,0000,11BF :3590 =0 SUBTEST
U 1151, 0018,0038,0980,09E0,0000,1152 :3591 RC[OC],K[.2] ; SET THE LOOP COUNT
:3592 =0
U 1152, 0000,003D,0180,0800,0000,11C6 :3593 T144L3: CALL,J/GETDATA ; FETCH AMX, BMX, AND EXP DATA
U 1153, 0000,003C,0180,0800,0000,1156 :3594 NOP
U 1156, 0000,003D,0180,0800,0000,11A5 :3595 =0 ERLOOP
U 1157, 0000,003C,0180,0800,0000,1158 :3596 NOP
U 1158, 0000,003D,0180,0800,0000,11CF :3597 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
U 1159, 0010,C014,0180,0800,0070,13B6 :3598 SYNC1B: ALU LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 13B6, 0000,003C,3DF0,2C00,0000,13B7 :3599 Q_ID[PSL]
U 13B7, 0019,2034,09C0,0800,0000,13B8 :3600 Q-Q.AND,K[.2] ; MASK V BIT
U 13B8, 001D,A000,0180,0800,0010,13B9 :3601 A[U-Q-D,CLK,UBCC,BYTE] ; CHECK
U 13B9, 0000,013C,0180,0800,0000,115A :3602 Z?
U 115A, 0001,203D,0180,09E8,0000,11AB :3603 =0 ERROR2,RC[OD],Q
:3604
:3605 ;+
:3606 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3607 ; -
:3608
U 115B, 0000,003C,0180,0A10,0000,13BA :3609 LAB R[2]
U 13BA, 0018,0014,1180,0A90,0000,13BB :3610 R[2] LA+K[.4] ; INCREMENT ADR OF AMX DATA
U 13BB, 0000,003C,0180,0A18,0000,13BC :3611 LAB R[3]
U 13BC, 0018,0014,1180,0A98,0000,13BD :3612 R[3] LA+K[.4] ; AND BMX DATA

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U 13BD, 0000,003C,0180,0A20,0000,13BE :3613 LAB R[4]
U 13BE, 0018,0014,0580,0AA0,0000,13BF :3614 R[4] LA+K[.1] ; AND EXPECTED DATA
U 13BF, 0000,003C,0180,0A08,0000,13C0 :3615 LAB R[1]
U 13C0, 0018,0014,1180,0A88,0000,13C1 :3616 R[1] LA+K[.4] ; INCREMENT ADR OF IB DATA
U 13C1, 0810,0038,0180,0960,0000,13C2 :3617 D R[0C]
U 13C2, 0019,8000,0580,09E0,0010,13C3 :3618 R[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
U 13C3, 0000,013C,0180,0800,0000,115C :3619 Z?
U 115C, 0000,003C,0180,0800,0000,1152 :3620 =0 J/T144L3
:3621
:3622
:3623 :////////////////////
:3624 :+
:3625 : VSELECT=0 * INV BMX SIGN IS FALSE. ALU MUST BE DOING AN AMX .AND.
:3626 : BMX FUNCTION TO GET CORRECT ALU DATA. FIRST TIME THRU LOOP IS DATA TYPE
:3627 : BYTE, SECOND TIME IS DATA TYPE LONG.
:3628 :-
:3629
U 115D, 0018,0038,0980,09E0,0000,115E :3630 T144S4: R[0C] K[.2] ; SET THE LOOP COUNT
U 115E, 0000,003D,0180,0800,0000,11BF :3631 =0 SUBTEST
U 115F, 0000,003C,0180,0A08,0000,13C4 :3632 LAB R[1]
U 13C4, 0018,0000,0180,0A88,0000,1160 :3633 R[1] LA-K[.8] ; SET ADR OF IB DATA
:3634 =0
U 1160, 0000,003D,0180,0800,0000,11C6 :3635 T144L4: CALL,J/GETDATA ; GET AMX, BMX, AND EXP DATA
U 1161, 0000,003C,0180,0800,0000,1162 :3636 NOP
U 1162, 0000,003D,0180,0800,0000,11A5 :3637 =0 ERLOOP
U 1163, 0000,003C,0180,0800,0000,1164 :3638 NOP
U 1164, 0000,003D,0180,0800,0000,11CF :3639 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
U 1165, 0010,C034,0180,0800,0070,13C5 :3640 SYNC1C: ALU LA.AND.LC,SET.CC(INST) ; EXECUTE THE TEST
U 13C5, 0000,003C,3DF0,2C00,0000,13C6 :3641 Q ID[PSL]
U 13C6, 0019,2034,09C0,0800,0000,13C7 :3642 Q-Q.AND.K[.2] ; MASK V BIT
U 13C7, 001D,A000,0180,0800,0010,13C8 :3643 A[U-Q-D,CLK.UBCC,BYTE ; CHECK
U 13C8, 0000,013C,0180,0800,0000,1166 :3644 Z?
U 1166, 0001,203D,0180,09E8,0C00,11A8 :3645 =0 ERROR2,R[0D]_Q
:3646
:3647 :+
:3648 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3649 :-
:3650
U 1167, 0000,003C,0180,0A10,0000,13C9 :3651 LAB R[2]
U 13C9, 0018,0014,1180,0A90,0000,13CA :3652 R[2] LA+K[.4] ; INCREMENT ADR OF AMX DATA
U 13CA, 0000,003C,0180,0A18,0000,13CB :3653 LAB R[3]
U 13CB, 0018,0014,1180,0A98,0000,13CC :3654 R[3] LA+K[.4] ; AND BMX DATA
U 13CC, 0000,003C,0180,0A20,0000,13CD :3655 LAB R[4]
U 13CD, 0018,0014,0580,0AA0,0000,13CE :3656 R[4] LA+K[.1] ; AND EXPECTED DATA
U 13CE, 0000,003C,0180,0A08,0000,13CF :3657 LAB R[1]
U 13CF, 0018,0014,1180,0A88,0000,13D0 :3658 R[1] LA+K[.4] ; INCREMENT ADR OF IB DATA
U 13D0, 0810,0038,0180,0960,0000,13D1 :3659 D R[0C]
U 13D1, 0019,8000,0580,09E0,0010,13D2 :3660 R[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
U 13D2, 0000,013C,0180,0800,0000,1168 :3661 Z?
U 1168, 0000,003C,0180,0800,0000,1160 :3662 =0 J/T144L4
U 1169, 0000,003C,0180,0800,0000,116A :3663 NOP
:3664
:3665
:3666 :////////////////////
:3667 :+

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:3668 : VSELECT=5--- PSL V_VDETECT SW
:3669 :-
:3670
:3671 =0
:3672 T144S5: CALL,J/GETDATA ; GET EXP DATA
:3673 NOP
:3674 =0 SUBTEST
:3675 NOP
:3676 =0 ERLOOP
:3677 NOP
:3678 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
:3679 SYNC1D: SET.CC(INST) ; EXECUTE THE TEST
:3680 Q_ID[PSL]
:3681 Q-Q.AND.K[.2] ; MASK THE V BIT
:3682 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
:3683 Z?
:3684 =0 ERROR2,RC[0D]_Q
:3685
:3686
:3687 :////////////////////
:3688 :+
:3689 : VSELECT=6 * VDETECT SW IS TRUE--- PSL V_VDETECT SW+EALU<9:8>=01
:3690 :-
:3691
:3692 T144S6: RC[0C] K[.3] ; SET THE LOOP COUNT
:3693 =0 SUBTEST
:3694 LAB R[4]
:3695 R[4] LA+K[.1] ; INCREMENT ADR OF EXP DATA
:3696 LAB R[1]
:3697 R[1] LA+K[.4] ; INCREMENT ADR OF IB DATA
:3698 =0
:3699 T144L6: CALL,J/GETDATA ; GET EALU DATA AND EXP V BIT
:3700 SC R[0] ; PUT EALU DATA IN SC
:3701 =0 ERLOOP
:3702 NOP
:3703 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
:3704 SYNC1E: EALU_SC,SET.CC(INST) ; EXECUTE THE TEST
:3705 Q_ID[PSL]
:3706 Q-Q.AND.K[.2] ; MASK THE V BIT
:3707 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
:3708 Z?
:3709 =0 ERROR2,RC[0D]_Q
:3710
:3711 :+
:3712 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3713 :-
:3714
:3715 LAB R[2]
:3716 R[2] LA+K[.4] ; INCREMENT ADR OF AMX DATA
:3717 LAB R[4]
:3718 R[4] LA+K[.1] ; INCREMENT ADR OF EXP V BIT
:3719 D RC[0C]
:3720 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
:3721 Z?
:3722 =0 J/T144L6

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U 116A, 0000,003D,0180,0800,0000,11C6
 U 116B, 0000,003C,0180,0800,0000,116C
 U 116C, 0000,003D,0180,0800,0000,11BF
 U 116D, 0000,003C,0180,0800,0000,116E
 U 116E, 0000,003D,0180,0800,0000,11A5
 U 116F, 0000,003C,0180,0800,0000,1170
 U 1170, 0000,003D,0180,0800,0000,11CF
 U 1171, 0000,C03C,0180,0800,0070,13D3
 U 13D3, 0000,003C,3DF0,2C00,0000,13D4
 U 13D4, 0019,2034,09C0,0800,0000,13D5
 U 13D5, 001D,A000,0180,0800,0010,13D6
 U 13D6, 0000,013C,0180,0800,0000,1172
 U 1172, 0001,203D,0180,09E8,0000,11A8

U 1173, 0018,0038,0D80,09E0,0000,1174
 U 1174, 0000,003D,0180,0800,0000,11BF
 U 1175, 0000,003C,0180,0A20,0000,13D7
 U 13D7, 0018,0014,0580,0AA0,0000,13D8
 U 13D8, 0000,003C,0180,0A08,0000,13D9
 U 13D9, 0018,0014,1180,0A88,0000,1176

U 1176, 0000,003D,0180,0800,0000,11C6
 U 1177, 0000,003C,0180,0A00,0082,1178
 U 1178, 0000,003D,0180,0800,0000,11A5
 U 1179, 0000,003C,0180,0800,0000,117A
 U 117A, 0000,003D,0180,0800,0000,11CF
 U 117B, 0000,C03C,0180,0800,0070,13DA
 U 13DA, 0000,003C,3DF0,2C00,0000,13DB
 U 13DB, 0019,2034,09C0,0800,0000,13DC
 U 13DC, 001D,A000,0180,0800,0010,13DD
 U 13DD, 0000,013C,0180,0800,0000,117C
 U 117C, 0001,203D,0180,09E8,0000,11A8

U 117D, 0000,003C,0180,0A10,0000,13DE
 U 13DE, 0018,0014,1180,0A90,0000,13DF
 U 13DF, 0000,003C,0180,0A20,0000,13E0
 U 13E0, 0018,0014,0580,0AA0,0000,13E1
 U 13E1, 0810,0038,0180,0960,0000,13E2
 U 13E2, 0019,8000,0580,09E0,0010,13E3
 U 13E3, 0000,013C,0180,0800,0000,117E
 U 117E, 0000,003C,0180,0800,0000,1176


```

3723
3724
3725 :///////////////////////////////////////////////////
3726 :+
3727 : VSELECT=6 * VDETECT SW IS FALSE.--- PSL V_-VDETECT SW*-ALU=0
3728 :-
3729
U 117F, 0000,003C,0180,0A08,0000,1180 3730 T144S7: LAB RC1]
U 1180, 0000,003D,0180,0800,0000,11BF 3731 =0 SUBTEST
U 1181, 0018,0014,1180,0A88,0000,13E4 3732 RC1]_LA+K[.4] ; INCREMENT ADR OF IB DATA
U 13E4, 0018,0038,4980,0A80,0000,13E5 3733 RC0]_K[.FF] ; SET ALU DATA
U 13E5, 0018,0038,0980,09F0,0000,13E6 3734 RC0E]_K[.2] ; SET EXP DATA
U 13E6, 0018,0038,0980,09E0,0000,1182 3735 RC0C]_K[.2] ; SET THE LOOP COUNT
U 1182, 0000,003D,0180,0800,0000,11A5 3736 =0 ERLOOP
U 1183, 0000,003C,0180,0800,0000,1184 3737 NOP
3738 =0
3739 T144L7: ALU_RC1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1184, 2000,003D,0180,0A08,4200,11DF 3740 NOP
U 1185, 0000,003C,0180,0800,0000,1186 3741 =0 CALL,J/DISPAT ; LATCH THE DATA TYPE
U 1186, 0000,003D,0180,0800,0000,11C4 3742 NOP
U 1187, 0000,003C,0180,0800,0000,1188 3743 =0 CALL,J/INITVBIT ; SET COMPLIMENT V BIT
U 1188, 0000,003D,0180,0800,0000,11CF 3744 SYNC1F: ALU_RC0],SET.CC(INST) ; EXECUTE THE TEST
U 1189, 0000,003C,0180,0A00,0070,13E7 3745 Q_ID[PSL]
U 13E7, 0000,003C,3DF0,2C00,0000,13E8 3746 Q-Q.AND.K[.2] ; MASK THE V BIT
U 13E8, 0019,2034,09C0,0800,0000,13E9 3747 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 13E9, 001D,A000,0180,0800,0010,13EA 3748 Z?
U 13EA, 0000,013C,0180,0800,0000,118A 3749 =0 ERROR2,RC0D]_Q
U 118A, 0001,203D,0180,09E8,0000,11A8 3750
3751 :+
3752 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
3753 :-
3754
U 118B, 0003,003C,0180,0A80,0000,13EB 3755 RC0] 0 ; SET ALU DATA
U 13EB, 0003,003C,0180,09F0,0000,13EC 3756 RC0E] 0 ; SET EXPECTED DATA
U 13EC, 0810,0038,0180,0960,0000,13ED 3757 D RC0C]
U 13ED, 0019,8000,0580,09E0,0010,13EE 3758 RC0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
U 13EE, 0000,013C,0180,0800,0000,118C 3759 Z?
U 118C, 0000,003C,0180,0800,0000,1184 3760 =0 J/T144L7
U 118D, 0000,003C,0180,0800,0000,118E 3761 NOP
3762
3763 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST
3764 :X 450
3765 : VSELECT=0, INV BMX SIGN TRUE, DATA TYPE BYTE, SUBTST 1 & 2
3766 :$ 5080,0050
3767 : VSELECT=0, INV BMX SIGN FALSE, DATA TYPE BYTE, SUBTST 3 & 4, LOOP COUNT = 2
3768 :$ 6096,0000
3769 : VSELECT=0, INV BMX SIGN FALSE, DATA TYPE LONG, SUBTST 3 & 4, LOOP COUNT = 1
3770 :$ 50F2,0000
3771 : VSELECT=5, SUBTST 5
3772 :$ 0000,0000
3773 : VSELECT=6, VDETECT SW TRUE, DATA TYPE FLOAT, SUBTST 6
3774 :$ 6040,0050
3775 : VSELECT=6, VDETECT SW FALSE, DATA TYPE FLOAT, SUBTST 7
3776 :$ 6048,0000
3777

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:3778
:3779
:3780 : THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:
:3781 :X 470
:3782 : SUBTST 1, LOOP COUNT 4 THRU 1
:3783 :$ 8080,8000
:3784 :$ 8040,8000
:3785 :$ 0000,0000
:3786 :$ 8080,8000
:3787 :$ 0000,0000
:3788 : SUBTST 2, LOOP COUNT 3 THRU 1
:3789 :$ 8080,8000
:3790 :$ 0000,0000
:3791 :$ 0080,0000
:3792 : SUBTST 3, LOOP COUNT 2 AND 1
:3793 :$ 0000,0000
:3794 :$ 0000,0000
:3795 : SUBTST 4, LOOP COUNT 2 AND 1
:3796 :$ 8080,8000
:3797 :$ 8080,8000
:3798 : EALU DATA, SUBTST 6
:3799 :$ 0100,0000
:3800 :$ 300,0000
:3801 :$ 0000,0000
:3802
:3803 : THE FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:
:3804 :X 480
:3805 : SUBTST 1, LOOP COUNT 5 THRU 1
:3806 :$ 0080,0000
:3807 :$ 8040,8000
:3808 :$ 0080,0000
:3809 :$ 8000,8000
:3810 :$ 8000,8000
:3811 : SUBTST 2, LOOP COUNT 3 THRU 1
:3812 :$ 8000,8000
:3813 :$ 0080,0000
:3814 :$ 0080,0000
:3815 : SUBTST 3, LOOP COUNT 2 AND 1
:3816 :$ 0080,0000
:3817 :$ 0000,8000
:3818 : SUBTST 4, LOOP COUNT 2 AND 1
:3819 :$ 8000,8000
:3820 :$ 8080,0000
:3821
:3822 : THE FOLLOWING IS THE EXPECTED V BIT FOR THE ABOVE TEST:
:3823 :X 4E0
:3824 :$ 0202,0000,0000,0000,0202,0000,0200,0000
:3825
:3826
:3827 =0
:3828 T145: NEWTST
:3829 NOP
:3830 ENDTST: NEWTST
:3831

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U 118E, 0000,003D,0180,0800,0000,1191
 U 118F, 0000,003C,0180,0800,0000,13EF
 U 13EF, 0000,003D,0180,0800,0000,1191

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2072=	2073=	2158=	2159=	2179=	2180=	2253=	2254=
U 1010	2039=	2040=	2041=	2042=	2043=	2044=	2045=	2046=
U 1018	2181=	2182=	2183=	2184=	2188=	2189=	2278=	2279=
U 1020	2195=	2196=	2234=	2235=	2236=	2237=	1846	2676=
U 1028	2245=	2246=	2247=	2248=	2249=	2250=	1869	2677=
U 1030	2259=	2267=	2269=	2270=	2272=	2273=	1870	2720=
U 1038	2274=	2275=	2283=	2284=	2373=	2374=	1871	2721=
U 1040	2375=	2376=	2378=	2379=	2388=	2389=	2401=	2402=
U 1048	2404=	2405=	2409=	2415=	2426=	2434=	1920:	1872
U 1050	2438=	2439=	2440=	2441=	2451=	2452=	2454=	2455=
U 1058	2459=	2465=	1924:	1873	2476=	2477=	1928:	1874
U 1060	2485=	2493=	2495=	2496=	2497=	2498=	2499=	2500=
U 1068	2517=	2518=	2519=	2520=	2521=	2522=	2528=	2534=
U 1070	2545=	2546=	2640=	2641=	2650=	2651=	2652=	2653=
U 1078	2660=	2666=	2670=	2671=	2683=	2691=	2692=	2693=
U 1080	2695=	2696=	2703=	2709=	2713=	2714=	2729=	2737=
U 1088	2738=	2739=	2740=	2741=	2748=	2749=	2753=	2761=
U 1090	2762=	2763=	2764=	2765=	2766=	2767=	2774=	2775=
U 1098	2776=	2777=	2785=	2793=	2794=	2795=	2796=	2797=
U 10A0	2804=	2805=	2806=	2807=	2815=	2816=	2860=	2868=
U 10A8	2869=	2870=	2871=	2872=	2879=	2880=	2888=	2889=
U 10B0	2894=	2895=	2903=	2904=	2909=	2910=	2918=	2919=
U 10B8	2926=	2934=	2935=	2936=	2937=	2938=	2939=	2940=
U 10C0	2948=	2949=	2954=	2955=	2959=	2960=	3024=	3025=
U 10C8	3033=	3034=	3035=	3036=	3044=	3050=	3051=	3052=
U 10D0	3060=	3071=	3072=	3073=	3081=	3087=	3088=	3089=
U 10D8	3097=	3105=	3106=	3107=	3108=	3109=	3111=	3112=
U 10E0	3117=	3118=	3126=	3133=	3135=	3136=	3144=	3150=
U 10E8	3155=	3156=	3164=	3170=	3174=	3175=	3183=	3184=
U 10F0	3196=	3197=	3243=	3250=	3251=	3252=	3256=	3257=
U 10F8	3258=	3259=	3269=	3270=	3281=	3289=	3291=	3292=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1875	3293=	3294=	1840:	1841:	1842:	1843:
U 1110	3309=	3310=	3311=	3312=	3313=	3314=	3326=	3332=
U 1118	3339=	3340=	3347=	3355=	3356=	3357=	3358=	3359=
U 1120	3360=	3361=	3362=	3363=	3374=	3382=	3383=	3384=
U 1128	3386=	3387=	3388=	3389=	3390=	3391=	3403=	3404=
U 1130	3405=	3406=	3417=	3418=	3501=	3502=	3503=	3504=
U 1138	3518=	3519=	3521=	3522=	3523=	3524=	3525=	3526=
U 1140	3531=	3537=	3546=	3555=	3556=	3557=	3559=	3560=
U 1148	3561=	3562=	3563=	3564=	3569=	3570=	3579=	3588=
U 1150	3590=	3591=	3593=	3594=	1882	2012:	3595=	3596=
U 1158	3597=	3598=	3603=	3609=	3620=	3630=	3631=	3632=
U 1160	3635=	3636=	3637=	3638=	3639=	3640=	3645=	3651=
U 1168	3662=	3663=	3672=	3673=	3674=	3675=	3676=	3677=
U 1170	3678=	3679=	3684=	3692=	3693=	3694=	3699=	3700=
U 1178	3701=	3702=	3703=	3704=	3709=	3715=	3722=	3730=
U 1180	3731=	3732=	3736=	3737=	3739=	3740=	3741=	3742=
U 1188	3743=	3744=	3749=	3755=	3760=	3761=	3828=	3829=
U 1190	1883	1897	1898	1899	1900	1901	1902	1903
U 1198	1904	1905	1906	1907	1908	1909	1910	1911

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	1912	1913	1914	1915	1916	1917	1918	1919
U 11A8	1922	1923	1966	1967	1968	1969	1970	1971
U 11B0	1972	1973	1974	1975	1976	1977	1978	1979
U 11B8	1980	1981	1983	1984	1985	1986	1988	1998
U 11C0	1999	2007	2008	2009	2018	2047	2063	2064
U 11C8	2065	2066	2067	2068	2069	2070	2071	2082
U 11D0	2083	2084	2085	2086	2087	2088	2089	2098
U 11D8	2099	2100	2101	2102	2103	2104	2105	2116
U 11E0	2117	2118	2119	2120	2121	2122	2126	2127
U 11E8	2128	2129	2130	2160	2161	2162	2163	2164
U 11F0	2165	2166	2167	2168	2169	2176	2177	2178
U 11F8	2185	2186	2187	2190	2191	2192	2193	2194
U 1200	2021:	2244	2022:	2251	2023:	2252	2024:	2255
U 1208	2025:	2256	2257	2258	2268	2271	2276	2277
U 1210	2280	2281	2282	2377	2386	2387	2390	2391
U 1218	2392	2393	2394	2395	2396	2397	2398	2399
U 1220	2400	2403	2406	2407	2408	2416	2417	2418
U 1228	2419	2420	2421	2422	2423	2424	2425	2435
U 1230	2436	2437	2442	2443	2444	2445	2446	2447
U 1238	2448	2449	2450	2453	2456	2457	2458	2466
U 1240	2467	2468	2469	2470	2471	2472	2473	2474
U 1248	2475	2478	2479	2480	2481	2482	2483	2484
U 1250	2494	2501	2502	2503	2504	2505	2507	2508
U 1258	2509	2510	2511	2512	2513	2514	2515	2516
U 1260	2523	2524	2525	2526	2527	2535	2536	2537
U 1268	2538	2539	2540	2541	2542	2543	2544	2642
U 1270	2649	2654	2655	2656	2657	2658	2659	2667
U 1278	2668	2669	2672	2673	2674	2675	2678	2679
U 1280	2680	2681	2682	2697	2698	2699	2700	2701
U 1288	2702	2710	2711	2712	2715	2716	2717	2026:
U 1290	2718	2719	2722	2723	2724	2725	2726	2727
U 1298	2728	2742	2743	2744	2745	2746	2747	2750
U 12A0	2751	2752	2768	2769	2770	2771	2772	2773
U 12A8	2778	2780	2028:	2781	2782	2783	2784	2798
U 12B0	2799	2800	2801	2802	2803	2808	2810	2811
U 12B8	2812	2813	2814	2873	2874	2875	2876	2877
U 12C0	2878	2881	2882	2883	2027:	2884	2885	2886
U 12C8	2887	2890	2891	2892	2893	2896	2897	2898
U 12D0	2899	2900	2901	2902	2905	2906	2907	2908
U 12D8	2911	2912	2913	2914	2915	2916	2917	2920
U 12E0	2921	2922	2923	2924	2925	2941	2942	2943
U 12E8	2944	2945	2946	2947	2950	2951	2952	2953
U 12F0	2956	2957	2958	3037	3038	3039	3040	3041
U 12F8	3042	3043	3053	3054	3055	3056	3057	3058
U 1300	3059	3074	3075	3076	3077	3078	3079	3080
U 1308	3090	3091	3092	3093	3094	3095	3096	3110
U 1310	3113	3114	3115	3116	3119	3120	3121	3122
U 1318	3123	3124	3125	3134	3137	3138	3139	3140
U 1320	3141	3142	3143	3151	3152	3153	3154	3157
U 1328	3158	3159	3160	3161	3162	3163	3171	3172
U 1330	3173	3176	3177	3178	3179	3180	3181	3182
U 1338	3190	3191	3192	3193	3194	3195	3253	3254
U 1340	3260	3261	3262	3263	3264	3265	3266	3267

22-ESKAH-V132
ESKAH38.MCR

Line Number Index

MICRO2

1M(01)

16-DEC-82 12:24:52

M 2

SEQ 1051
Page 9

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3268	3271	3272	3273	3274	3275	3276	3277
U 1350	3278	3279	3280	3295	3296	3297	3298	3299
U 1358	3300	3301	3302	3303	3304	3306	3307	3308
U 1360	3315	3316	3317	3318	3319	3320	3321	3322
U 1368	3323	3324	3325	3333	3334	3335	3336	3337
U 1370	3338	3341	3342	3343	3344	3345	3346	3364
U 1378	3365	3366	3367	3368	3369	3370	3371	3372
U 1380	3373	3385	3392	3393	3394	3395	3396	3397
U 1388	3398	3399	3400	3401	3402	3407	3408	3409
U 1390	3410	3411	3412	3413	3414	3415	3416	3505
U 1398	3506	3507	3508	3516	3517	3527	3528	3529
U 13A0	3530	3538	3539	3540	3541	3542	3543	3544
U 13A8	3545	3565	3566	3567	3568	3571	3572	3573
U 13B0	3574	3575	3576	3577	3578	3589	3599	3600
U 13B8	3601	3602	3610	3611	3612	3613	3614	3615
U 13C0	3616	3617	3618	3619	3633	3641	3642	3643
U 13CB	3644	3652	3653	3654	3655	3656	3657	3658
U 13D0	3659	3660	3661	3680	3681	3682	3683	3695
U 13D8	3696	3697	3705	3706	3707	3708	3716	3717
U 13E0	3718	3719	3720	3721	3733	3734	3735	3745
U 13E8	3746	3747	3748	3756	3757	3758	3759	3830
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F6	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

22-ESKAH-V132 Line Number Index
ESKAH38.MCR

MICRC2 1M(01)

16-DEC-82 12:24:52

N 2

SEO 1052
Page 9

Words not
in bounds

ESK00DEF	0
ESK00MAC	0
ESKAHMAC	0
ESKAH38	1024

Used	1024
Remaining	

Total microwords used in memory U: 1024

Total microwords remaining in memory U: 0

Highest address used in memory U: 13FF (hex)

ZZ-ESKAH-V132 Line Number Index
ESKAH38.MCR MICRO2 1M(01) 16-DEC-82 12:24:52

B 3

SEQ 1053
Page 9

ZZ
ES

; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH38.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

CCCCCCCCCCCC

```

3      Control ROM Field Definitions
548    Register Transfer Macro Definitions
1413   Non-transfer Functions
1485   Branch Enable Macro Definitions
1564   MICRO DIAGNOSTIC DEFINED MACROS
2113   TEST 146      INSTRUCTION DEPENDENT COND CODE LOAD (Z BIT)
2313   TEST 147      INSTRUCTION DEPENDENT COND CODE LOAD (N BIT)
2545   TEST 148      CM CONDITION CODE LOAD = 4
2620   TEST 149      CM CONDITION CODE LOAD = 5 (Z BIT)
2690   TEST 14A      CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)
2762   TEST 14B      CM CONDITION CODE LOAD = 6 (V BIT)
2882   TEST 14C      CM INSTRUCTION DEPENDENT COND CODE LOAD
3362   TEST 14D      CM BRANCH ENABLE 8 -- END DP1
3463   TEST 14E      CM BRANCH ENABLE 9 -- PC MODES
3546   TEST 14F      CM BRANCH ENABLE A -- REI
3627   TEST 150      VAX MODE BRANCH ENABLE 8 -- DATA TYPE

```

XXXXXXXXXXXX

XXXXXXXXXXXX

333

ZZ-ESKAH-V132 Subroutines
ESKAH39.MCR

MICRO2 1M(01) 16-DEC-82 12:30:35

D 3

SEQ 1055
Page

:1 .NOLIST
:1804 .LIST
:1805

ZZ
ES
CCCCC
CCC
CCCCCCCCCCCC
CCCCCCCC
CCCC


```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
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:1815
:1816
:1817
:1818
:1819
:1820
:1821
:1822
:1823
:1824
:1825
:1826
:1827
:1828
:1829
:1830
U 1100, 0000,003C,19C0,0A78,0084,7001
U 1101, 0000,003C,05C0,0A78,0084,7001
U 1102, 0000,003C,09C0,0A78,0084,7001
U 1103, 0000,003C,0DC0,0A78,0084,7001
U 1104, 0000,003C,11C0,0A78,0084,7001
U 1105, 0000,003C,D5C0,0A78,0084,7001
U 1106, 0000,003C,D9C0,0A78,0084,7001
U 1107, 0000,003C,5DC0,0A78,0084,7001
U 1108, 0000,003C,01C0,0A78,0084,7001
U 110C, 0000,003C,85C0,0A78,0084,7001
U 110D, 0000,003C,89C0,0A78,0084,7001
U 110E, 0000,003C,65C0,0A78,0084,7001
U 110F, 0000,003C,61C0,0A78,0084,71FA
:1844
U 1001, 0001,2024,0180,0800,0010,104F
U 104F, 0000,013C,0180,0800,0000,1002
U 1002, 0001,2036,0180,0AF8,0000,0000
:1848
:1849
:1850
:1851
:1852
:1853
:1854
:1855
:1856
:1857
:1858
:1859
:1860

```

.REGION/1000,13FF

FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT
 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 R[OF] AND DO A RETURNO.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
 EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

1100:	SC_K[ZERO],Q R[OF],J/TRPH0	: SYSTEM INIT
1101:	SC_K[.1],Q R[OF],J/TRPH0	: DATA UNALIGNED
1102:	SC_K[.2],Q R[OF],J/TRPH0	: X PAGE ERROR
1103:	SC_K[.3],Q R[OF],J/TRPH0	: TB MODIFY
1104:	SC_K[.4],Q R[OF],J/TRPH0	: TB PROT ERROR
1105:	SC_K[.6],Q R[OF],J/TRPH0	: TB MISS
1106:	SC_K[.9],Q R[OF],J/TRPH0	: RES FLOAT OPER
1107:	SC_K[.7],Q R[OF],J/TRPH0	: TB PARITY
1108:	SC_K[.8],Q R[OF],J/TRPH0	: CACHE PARITY
110C:	SC_K[.C],Q R[OF],J/TRPH0	: RDS
110D:	SC_K[.D],Q R[OF],J/TRPH0	: TIME OUT
110E:	SC_K[.10],Q R[OF],J/TRPH0	: ODD ADDRESS
110F:	SC_K[.F],Q R[OF],J/TRPH2	: CS PARITY
TRPH0:	ALU_Q.ANDNOT.MASK,CLK.UBCC	: WAS TRAP EXPECTED?
	Z?	: BRANCH IF NO
=0	ALU_Q[AND]MASK,R[OF]_ALU,RETURNO	: CLEAR THE BIT AND RETURN

THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
 TRAP CODE--INDICATES WHICH TRAP OCCURRED
 FAULT STATUS REGISTER
 SBI ERROR REGISTER
 TIMEOUT ADDRESS REGISTER
 MAINTENANCE REGISTER

```

:1861
:1862
:1863
:1864
:1865
U 1003. 0018.0038.1D80.09E8.0000.1004 :1866
U 1004. 0000.003D.D980.0800.0084.7231 :1867
U 1005. 0000.003C.49F0.2C00.0000.105B :1868
U 105B. 0001.203C.4DF0.2DB0.0000.105F :1869
U 105F. 0001.203C.65F0.2DB8.0000.1109 :1870
U 1109. 0001.203C.6DF0.2DD8.0000.11F6 :1871
U 11F6. 0001.203C.75F0.2DE0.0000.11F7 :1872
U 11F7. 0001.203C.79F0.2DC8.0000.11F8 :1873
U 11F8. 0001.203C.69F0.2DC0.0000.11F9 :1874
U 11F9. 0001.203C.81F0.2DD0.0000.1000 :1875
U 1000. 0001.203D.0180.09F0.0000.1216 :1876
:1877
:1878
:1879
:1880
:1881
U 11FA. 0001.2024.0180.0800.0010.11FB :1882
U 11FB. 0000.013C.0180.0800.0000.1006 :1883
U 1006. 0001.2036.0180.0AF8.0000.0001 :1884
U 1007. 0000.003C.0180.0800.0000.1003 :1885
:1886
:1887
:1888
:1889
:1890
:1891
:1892
:1893
:1894
:1895
:1896
U 11FC. 0000.003C.65F8.0800.0084.71FD :1897
U 11FD. 0818.0038.8D80.0800.0000.11FE :1898
U 11FE. 0D00.003C.0180.0800.0000.11FF :1899
U 11FF. 0000.003C.3D80.3C00.0000.1201 :1900
U 1201. 0818.0038.0580.0800.0000.1203 :1901
U 1203. 0D00.003C.0180.0800.0000.1205 :1902
U 1205. 0F00.003C.3180.3C00.0000.1207 :1903
U 1207. 0000.003C.5D80.3C00.0000.1209 :1904
U 1209. 0000.003C.3980.3C00.0000.120A :1905
U 120A. 0000.003C.2980.3C00.0000.120B :1906
U 120B. 0000.003C.4980.3C00.0000.120C :1907
U 120C. 0000.003C.7180.3C00.0000.120D :1908
U 120D. 0818.0038.C180.0800.0000.120E :1909
U 120E. 0000.003C.6580.3C00.0000.120F :1910
U 120F. 0F00.003C.6D80.3C00.0000.1210 :1911
U 1210. 0000.003C.6D80.3C00.0000.1211 :1912
U 1211. 0000.003C.6580.3C00.0000.1212 :1913
U 1212. 0003.003C.0180.09F0.0000.1213 :1914
U 1213. 0003.003C.0180.0AF8.0000.1214 :1915

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:1861
:1862
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:1911
:1912
:1913
:1914
:1915

```

```

TRPH1: RC[0D].SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6].Q.Q_ID[TBER1]
RC[7].Q.Q_ID[SBI.ERR]
RC[0B].Q.Q_ID[FAULT]
RC[0C].Q.Q_ID[MAINT]
RC[9].Q.Q_ID[PARITY]
RC[8].Q.Q_ID[TIME.ADDR]
RC[0A].Q.Q_ID[USTACK]
1000: RC[0E].Q.ERROR1

```

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:1879
:1880
:1881
:1882
:1883
:1884
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:1900
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:1911
:1912
:1913
:1914
:1915

```

```

TRPH2: ALU_Q.ANDNOT.MASK.CLK.UBCC : WAS THE TRAP EXPECTED?
Z? : BRANCH IF NO
=0 ALU_Q[AND]MASK,RC[0F].ALU,RETURN1 : RETURN
J/TRPH1 : REPORT UNEXPECTED TRAP

```

```

:1889
:1890
:1891
:1892
:1893
:1894
:1895
:1896
:1897
:1898
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:1900
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:1902
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:1906
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:1908
:1909
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:1911
:1912
:1913
:1914
:1915

```

```

SCOPE: SC_K[.10].Q_0 : SETUP TO WRITE IPL OF 1F
D_RC[.1F] : ...
D-DAL.SC
ID[PSL].D : WRITE THE PSL
D_K[.1] : SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES].D.D_0 : CLEAR THE CES REGISTER
ID[ACC.CS].D : SHUT OFF THE FLOATING POINT
ID[SIR].D : CLEAR THE SIR REGISTER
ID[CLK.CS].D : STOP INTERVAL TIMER
ID[TBER0].D : SHUT OFF THE TB
ID[COMP].D : CLEAR SILO COMPARATOR
D_K[.FFFF]
ID[SBI.ERR].D
ID[FAULT].D.D_0
ID[FAULT].D
ID[SBI.ERR].D
RC[0E].Q
RC[0F].Q

```

U 1214. 0003,003C,0180,09E8,0000,105E :1916
U 1215. 0818,0038,0980,0800,0000,105E :1917
U 1216. 0810,0038,0180,0978,0000,1217 :1918
U 1217. 0819,0034,4D80,0800,0000,104E :1919
U 104E. 0819,0030,1180,0800,0000,105E :1920
U 1218. 0810,0038,0180,0978,0000,1219 :1921
U 1219. 0819,0034,4D80,0800,0000,105A :1922
U 105A. 0819,0030,D580,0800,0000,105E :1923
:1924
:1925
:1926
:1927

U 105E. 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933

U 13F0. 0000,003C,0180,0800,0000,13F1 :1934
U 13F1. 0000,003C,0180,0800,0000,13F2 :1935
U 13F2. 0000,003C,0180,0800,0000,13F3 :1936
U 13F3. 0000,003C,0180,0800,0000,13F4 :1937
U 13F4. 0000,003C,0180,0800,0000,13F5 :1938
U 13F5. 0000,003C,0180,0800,0000,13F6 :1939
U 13F6. 0000,003C,0180,0800,0000,13F7 :1940
U 13F7. 0000,003C,0180,0800,0000,13F8 :1941
U 13F8. 0000,003C,0180,0800,0000,13F9 :1942
U 13F9. 0000,003C,0180,0800,0000,13FA :1943
U 13FA. 0000,003C,0180,0800,0000,13FB :1944
U 13FB. 0000,003C,0180,0800,0000,13FC :1945
U 13FC. 0000,003C,0180,0800,0000,13FD :1946
U 13FD. 0000,003C,0180,0800,0000,13FE :1947
U 13FE. 0000,003C,0180,0800,0000,13FF :1948
U 13FF. 0000,003C,0180,0800,0000,121A :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965

U 121A. 0018,0038,1980,0800,0000,122A :1966
U 121B. 0018,0038,1980,0800,0000,122B :1967
U 121C. 0018,0038,1980,0800,0000,122C :1968
U 121D. 0018,0038,1980,0800,0000,122D :1969
U 121E. 0018,0038,0980,0800,0000,122A :1970

RCEOD] 0,J/CALLCON : CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON : ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON

ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON

105E:
CALLCON:
ID[TXDB]_D,J/CALLCON : CALL THE CONSOLE

:+
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
:-

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

:+
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.

FOR EXAMPLE: IF A HEX '55' IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

:1961 : =0 D 0,CALL,J/DC5
:1962 : NOP
:1963 : =0 CALL,J/DC5
:-

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00


```

U 121F, 0018,0038,0980,0800,0000,122B :1971
U 1220, 0018,0038,0980,0800,0000,122C :1972
U 1221, 0018,0038,0980,0800,0000,122D :1973
U 1222, 0018,0038,0580,0800,0000,122A :1974
U 1223, 0018,0038,0580,0800,0000,122B :1975
U 1224, 0018,0038,0580,0800,0000,122C :1976
U 1225, 0018,0038,0580,0800,0000,122D :1977
U 1226, 0018,0038,C180,0800,0000,122A :1978
U 1227, 0018,0038,C180,0800,0000,122B :1979
U 1228, 0018,0038,C180,0800,0000,122C :1980
U 1229, 0018,0038,C180,0800,0000,122D :1981
:1982
U 122A, 0118,0038,1B80,0800,0000,122E :1983
U 122B, 0118,0038,0B80,0800,0000,122E :1984
U 122C, 0118,0038,0780,0800,0000,122E :1985
U 122D, 0118,0038,C380,0800,0000,122E :1986
:1987
U 122E, 0100,003E,0380,0800,0000,0001 :1988
:1989
:1990
:1991
:1992
:1993
:1994
:1995
:1996
:1997
U 122F, 0810,0038,4D80,0978,0000,1230 :1998
U 1230, 0019,4016,4D80,09F8,0000,0001 :1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
U 1231, 0010,0038,01C0,0978,0000,1232 :2007
U 1232, 0019,2034,4DC0,0800,0000,1233 :2008
U 1233, 0019,2032,1D80,09F8,0000,0001 :2009
:2010

```

```

DC5: ALU_K[.2],J/S01
DC6: ALU_K[.2],J/S10
DC7: ALU_K[.2],J/S11
DC8: ALU_K[.1],J/S00
DC9: ALU_K[.1],J/S01
DCA: ALU_K[.1],J/S10
DCB: ALU_K[.1],J/S11
DCC: ALU_K[.FFFF],J/S00
DCD: ALU_K[.FFFF],J/S01
DCE: ALU_K[.FFFF],J/S10
DCF: ALU_K[.FFFF],J/S11

S00: ALU_O(K),D_D.LEFT2,SI/7,J/SX
S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT

```

```

: +
: THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
: THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
: TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
: TYPING IT.
: -

```

```

SUBTST: D_RC[0F],KMX/.FF00
RC[0F]_D+K[.FF00],WORD,RETURN1

```

```

: +
: THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
: LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
: WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
: -

```

```

SETRCF: Q_RC[0F]
Q-Q.AND.K[.FF00]
RC[0F]_Q.OR.SC,RETURN1

```


:2011
:2012
:2013
:2014
:2015
:2016
:2017
:2018
:2019
:2020
:2021
:2022
:2023
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:2061
:2062
:2063
:2064
:2065

U 1234, 0038,003B,41C0,0800,0000,1200

U 1200, 0000,003E,0180,0800,0000,0001
U 1202, 0000,003E,0180,0800,0000,0001
U 1204, 0000,003E,0180,0800,0000,0001
U 1206, 0000,003E,0180,0800,0000,0001
U 1208, 0000,003E,0180,0800,0000,0001
U 1245, 0000,003E,0180,0800,0000,0001
U 1247, 0000,003E,0180,0800,0000,0001
U 124F, 0000,003E,0180,0800,0000,0001
U 1251, 0000,003E,0180,0800,0000,0001
U 1253, 0000,003E,0180,0800,0000,0001
U 1257, 0000,003E,0180,0800,0000,0001
U 128F, 0000,003E,0180,0800,0000,0001
U 128B, 0000,003E,0180,0800,0000,0001
U 128B, 0000,003E,0180,0800,0000,0001
U 12AA, 0000,003C,0180,0800,0000,1235

U 1235, 3000,003C,0180,6000,0000,1236
U 1236, 0000,003C,0180,F800,0000,1237
U 1237, 0000,003C,0180,F800,0000,1238
U 1238, 0000,003C,0180,F800,0000,1239
U 1239, 0000,003C,0180,F800,0000,123A
U 123A, 0000,003C,0180,F800,0000,123B
U 123B, 1000,003E,0180,F800,0000,0001

U 123C, 0000,003C,0180,0A10,0200,123D
U 123D, 0000,003C,0180,C800,0000,123E
U 123E, 0001,003C,0180,0A80,0000,123F
U 123F, 0000,003C,0180,0A18,0200,1240
U 1240, 0000,003C,0180,C800,0000,1241
U 1241, 0001,003C,0180,0980,0000,1242
U 1242, 0000,003C,0180,0A20,0200,1243
U 1243, 0000,803C,0180,C800,0000,1244
U 1244, 0019,0034,4980,09F0,0000,1010
U 1010, 2000,003D,0180,0A08,4200,1235

:+ THE FOLLOWING 15 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
: THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
: AND THEN EXECUTES THE CALL 3.
:-

SYNCOO:
DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/1200

1200: RETURN1
1202: RETURN1
1204: RETURN1
1206: RETURN1
1208: RETURN1
1245: RETURN1
1247: RETURN1
124F: RETURN1
1251: RETURN1
1253: RETURN1
1257: RETURN1
128F: RETURN1
128B: RETURN1
128B: RETURN1
12AA: NOP

; THIS LOCATION IS ECO'D TO 1155

:+ THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
: CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
: IS COMPLETELY FULL OF DATA.

: BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
:-

IBWAIT: LOAD,IB,IBC/START
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ,IBC/STOP,RETURN1

GETDATA:

VA R[2] : LOAD ADR OF AMX DATA
D[LONG]_CACHE.P : FETCH
R[0] D : SAVE
VA R[3] : LOAD ADR OF BMX DATA
D[LONG]_CACHE.P : FETCH
R[0] D : SAVE
VA R[4] : LOAD ADR OF EXP DATA
D[BYTE]_CACHE.P : FETCH
R[0E] D.AND.K[.FF] : SAVE
=0 ALU_RET],FLUSH,IB,CALL,J/IBWAIT : LOAD THE IB

```

U 1011. 0000.003C.0180.0800.0000.1012 :2066
U 1012. 0000.003D.0180.0800.0000.1234 :2067
U 1013. 0000.003E.0180.0800.0000.0001 :2068
                                           :2069
                                           :2070
                                           :2071
U 1246. 0813.001C.0180.0970.0000.1248 :2072
U 1248. 0819.0034.0980.0800.0000.1249 :2073
U 1249. 0000.003C.3DF0.2C00.0000.124A :2074
U 124A. 0019.2034.09C0.0800.0000.124B :2075
U 124B. 081D.0030.0180.0800.0000.124C :2076
U 124C. 0000.003C.3D80.3E00.0000.124D :2077
U 124D. 0810.0038.0180.097C.0000.124E :2078
U 124E. 0000.003E.0180.0900.0000.0001 :2079
                                           :2080
                                           :2081
                                           :2082
U 1250. 0813.001C.0180.0970.0000.1252 :2083
U 1252. 0819.0034.0180.0800.0000.1254 :2084
U 1254. 0000.003C.3DF0.2C00.0000.1255 :2085
U 1255. 0019.2034.01C0.0800.0000.1256 :2086
U 1256. 081D.0030.0180.0800.0000.1258 :2087
U 1258. 0000.003C.3D80.3E00.0000.1259 :2088
U 1259. 0810.0038.0180.0970.0000.125A :2089
U 125A. 0000.003E.0180.0900.0000.0001 :2090
                                           :2091
                                           :2092
U 125B. 0000.003C.3DF0.2C00.0000.125C :2093
U 125C. 0000.003C.8D80.0800.0084.725D :2094
U 125D. 0803.001C.0180.0800.0000.125E :2095
U 125E. 081D.0030.0180.0800.0000.125F :2096
U 125F. 0000.003E.3D80.3C00.0000.0001 :2097
                                           :2098
                                           :2099
                                           :2100
U 1008. 0000.003E.01F8.0800.0000.0001 :2101
U 1009. 0018.003A.05C0.0800.0000.0001 :2102
U 100A. 0018.003A.09C0.0800.0000.0001 :2103
U 100B. 0018.003A.0DC0.0800.0000.0001 :2104
U 100C. 0018.003A.11C0.0800.0000.0001 :2105
U 100D. 0018.0038.11C0.0800.0000.1260 :2106
U 100E. 0018.003A.D5C0.0800.0000.0001 :2107
U 100F. 0018.003A.5DC0.0800.0000.0001 :2108
U 1260. 0019.2016.05C0.0800.0000.0001 :2109
                                           :2110
                                           :2111
                                           :2112

```

```

NOP
=0 CALL,J/DISPAT ; LOAD THE DATA TYPE LATCH
RETURN1

INITVBIT:
D_NOT.RC[OE] ; GET COMPLIMENT EXP DATA
D_D.AND.K[.2] ; MASK
Q_ID[PSL] ; READ THE PSL
Q_Q.AND.K[.2] ; MASK THE V BIT
D_D.OR.Q ; INSERT T CC'S
ID[PSL] D,LAB_RC[] ; LOAD THE V BIT
D_RC[OE] ; GET EXPECTED DATA
LC_RC[],RETURN1 ; LATCH BMX DATA

INITNBIT:
D_NOT.RC[OE] ; GET COMPLIMENT EXP DATA
D_D.AND.K[.8] ; MASK
Q_ID[PSL] ; READ THE PSL
Q_Q.AND.K[.8] ; MASK THE N BIT
D_D.OR.Q ; INSERT N BIT
ID[PSL] D,LAB_RC[] ; LOAD THE N BIT
D_RC[OE] ; GET EXPECTED DATA
LC_RC[],RETURN1 ; LATCH BMX DATA

SETCM: Q_ID[PSL]
SC K[.1F]
D_NOT.MASK
D_D.OR.Q
ID[PSL]_D,RETURN1

=000
IBBRTABLE:
Q_0,RETURN1
Q_K[.1],RETURN1
Q_K[.2],RETURN1
Q_K[.3],RETURN1
REIENT: Q_K[.4],RETURN1
Q_K[.4],J/ADDONE
Q_K[.6],RETURN1
Q_K[.7],RETURN1
ADDONE: Q_Q+K[.1],RETURN1

```

```

:2113 .PAGE "TEST 146 INSTRUCTION DEPENDENT COND CODE LOAD (Z BIT)"
:2114 .*****
:2115 .++
:2116 .TEST 146 INSTRUCTION DEPENDENT Z BIT
:2117 .
:2118 .TEST DESCRIPTION
:2119 .THIS TEST CHECKS THE Z SELECT CODE OF 2 BY FLOATING A ZERO ACCROSS
:2120 .THE OUTPUT OF THE ALU AND CHECKING THAT THE Z BIT DOES NOT SET, AND
:2121 .THEN MAKING THE ALU OUTPUT ALL ONE'S AND CHECKING THAT THE Z BIT
:2122 .SETS.
:2123 .
:2124 .SUBTST 1 - CHECK THE FUNCTION WITH DATA TYPE BYTE
:2125 .SUBTST 2 - CHECK THE FUNCTION WITH DATA TYPE WORD
:2126 .SUBTST 3 - CHECK THE FUNCTION WITH DATA TYPE LONG
:2127 .
:2128 .LOGIC DESCRIPTION
:2129 .THIS TEST CHECKS PART OF THE INSTRUCTION DEPENDENT CONDITION CODE
:2130 .PROM, PART OF THE ZN PROM, PART OF THE MULTIPLEXOR THAT FEEDS
:2131 .THE Z DATA SIGNAL, AND THE GATE THAT GENERATES THE 'A=B' SIGNAL
:2132 .ON THE CEH MODULE.
:2133 .
:2134 .ERROR DESCRIPTION
:2135 .DATA: EXPECTED CONDITION CODES
:2136 .RECEIVED CONDITION CODES
:2137 .LOOP COUNT -- DESCRIBES WHICH BIT POSITION THE FLOATING ZERO
:2138 .IS CURRENTLY IN, I.E.:
:2139 .SUBTST 1 - 9=BIT 0, 8=BIT 1, ..., 1=BIT 8
:2140 .SUBTST 2 - 11=BIT 0, 10=BIT 1, ..., 1=BIT 16
:2141 .SUBTST 3 - 21=BIT 0, 20=BIT 1, ..., 1=BIT 32 (ALL ONES)
:2142 .
:2143 .SYNC POINT DESCRIPTION
:2144 .SUBTST 1 - SYNCA0--Z BIT CLOCKS
:2145 .SUBTST 2 - SYNCA1--Z BIT CLOCKS
:2146 .SUBTST 3 - SYNCA2--Z BIT CLOCKS
:2147 .--
:2148 .*****
:2149 .
:2150 T146: NEWTST[.3]
:2151 R[2],K[.4] ; INITIAL VALUE FOR Z BIT
:2152 =0 D,K[.10],CALL,J/DCO ; GEN ADR OF IB DATA
:2153 R[1],D ; EQUALS 100(16)
:2154 R[0],0-K[.1] ; ALEG DATA
:2155 RC[0],0-K[.1] ; BLEG DATA
:2156 RC[OE],0 ; INIT EXPECTED DATA
:2157 .
:2158 .
:2159 .////////////////////
:2160 .+
:2161 .Z SET WHEN ALEG=BLEG, DATA TYPE BYTE
:2162 .-
:2163 .
:2164 T146S1: RC[OC],K[.9] ; SET THE LOOP COUNT
:2165 =0 SUBTEST
:2166 NOP
:2167 =0 ALU,R[1],FLUSH.IB,CALL,J/IBWAIT ; LAOD THE IB
    
```

U 1014, 0018,0039,0D80,09F8,0000,11FC
 U 1015, 0018,0038,1180,0A90,0000,1016
 U 1016, 0818,0039,6580,0800,0000,121A
 U 1017, 0001,003C,0180,0A88,0000,1261
 U 1261, 001B,0000,0580,0A80,0000,1262
 U 1262, 001B,000C,0580,0980,0000,1263
 U 1263, 0003,003C,0180,09F0,0000,1264

U 1264, 0018,0038,D980,09E0,0000,1018
 U 1018, 0000,003D,0180,0800,0000,122F
 U 1019, 0000,003C,0180,0800,0000,101A
 U 101A, 2000,003D,0180,0A08,4200,1235


```

U 101B, 0000,003C,0180,0800,0000,101C :2168
U 101C, 0000,003D,0180,0800,0000,1234 :2169
U 101D, 0000,003C,0180,0800,0000,101E :2170
U 101E, 0000,003D,0180,0800,0000,1215 :2171
U 101F, 0800,003C,0180,0A10,0000,1265 :2172
U 1265, 0000,003C,3DF0,2C00,0000,1266 :2173
U 1266, 0019,2024,61C0,0800,0000,1267 :2174
U 1267, 081D,0030,0180,0800,0000,1268 :2175
U 1268, 0000,003C,3DE0,3E00,0000,1269 :2176
U 1269, 0810,0038,0180,0970,0000,126A :2177
U 126A, 0000,003C,0180,0900,0000,126B :2178
U 126B, 0010,C014,0180,0800,0070,126C :2179
U 126C, 0000,003C,3DF0,2C00,0000,126D :2180
U 126D, 0019,2034,11C0,0800,0000,126E :2181
U 126E, 001D,A000,0180,0800,0010,126F :2182
U 126F, 0000,013C,0180,0800,0000,1020 :2183
U 1020, 0001,203D,0180,09E8,0000,1218 :2184

:2185
:2186
:2187
:2188
:2189
:2190
:2191
:2192
:2193
:2194
:2195
:2196
:2197
:2198
:2199
:2200
:2201
:2202
:2203
:2204
:2205
:2206
:2207
:2208
:2209
:2210
:2211
:2212
:2213
:2214
:2215
:2216
:2217
:2218
:2219
:2220
:2221
:2222

:2168 NOP
:2169 CALL,J/DISPAT
:2170 NOP
:2171 ERLOOP
:2172 T146L1:D R[2]
:2173 Q_ID[PSL]
:2174 Q_Q.ANDNOT.K[.F]
:2175 D_D.OR.Q
:2176 ID[PSL] D,LAB_R[0]
:2177 D_RC[OE]
:2178 LC RC[0]
:2179 SYNCA0: ALD LA+LC,SET.CC(INST)
:2180 Q_ID[PSL]
:2181 Q_Q.AND.K[.4]
:2182 ACU_Q-D,CLK.UBCC,BYTE
:2183 Z?
:2184 =0 ERROR2,RC[OD]_Q
:2185
:2186
:2187
:2188
:2189
:2190 D_RC[0]
:2191 D_D.LEFT,S1/ZERO
:2192 RC[0] D
:2193 D_RC[OC]
:2194 ACU_D-K[.2],CLK.UBCC,BYTE
:2195 Z?
:2196 =0 J/T146P1
:2197 RC[OE]_K[.4]
:2198 RC[2] 0
:2199 T146P1: RC[OC]_D-K[.1],CLK.UBCC,BYTE
:2200 Z?
:2201 =0 J/T146L1
:2202
:2203
:2204
:2205
:2206
:2207
:2208
:2209 T146S2: LAB R[1]
:2210 R[1] LA+K[.4]
:2211 =0 SUBTEST
:2212 RC[0] 0-K[.1]
:2213 RC[2] R[.4]
:2214 RC[OE] 0
:2215 D K[.10]
:2216 RC[OC] D+K[.1]
:2217 =0 ALU_RET],FLUSH.IB,CALL,J/IBWAIT
:2218 NOP
:2219 =0 CALL,J/DISPAT
:2220 NOP
:2221 =0 ERLOOP
:2222 T146L2: D R[2]

: LATCH THE DATA TYPE
: INIT THE Z BIT
: GET EXPECTED VALUE
: LATCH THE BLEG DATA
: EXECUTE TEN TEST
: MASK THE Z BIT
: CHECK

: THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST

: GET BLEG DATA
: SHIFT SO ZERO FLOATS TO NEXT BIT
: GET THE LOOP COUNT
: TIME FOR A=B?
: NO
: SET EXPECTED VALUE
: SET INITIAL VALUE
: DECREMENT LOOP COUNT

: Z BIT SETS WHEN A=B, DATA TYPE WORD

: INCREMENT ADR OF IB DATA
: INIT BLEG DATA
: INITIAL VALUE OF Z BIT
: EXPECTED VALUE OF Z BIT
: SET THE LOOP COUNT
: LOAD THE IB
: LOAD THE DATA TYPE LATCH

```



```

U 127D. 0000.003C.3DF0.2C00.0000.127E :2223      Q_ID[PSL]
U 127E. 0019.2024.61C0.0800.0000.127F :2224      Q-Q.ANDNOT.K[F]
U 127F. 081D.0030.0180.0800.0000.1280 :2225      D-D.OR.Q
U 1280. 0000.003C.3D80.3E00.0000.1281 :2226      ID[PSL] D,LAB_R[0]      : INIT THE Z BIT
U 1281. 0810.0038.0180.0970.0000.1282 :2227      D_RC[OE]      : GET EXPECTED VALUE
U 1282. 0000.003C.0180.0900.0000.1283 :2228      LC RC[0]      : LATCH THE BLEG DATA
U 1283. 0010.C014.0180.0800.0070.1284 :2229      SYNCA1: ALD LA+LC,SET.CC(INST) : EXECUTE THE TEST
U 1284. 0000.003C.3DF0.2C00.0000.1285 :2230      Q_ID[PSL]
U 1285. 0019.2034.11C0.0800.0000.1286 :2231      Q-Q.AND.K[.4]      : MASK THE Z BIT
U 1286. 001D.A000.0180.0800.0010.1287 :2232      A[U-Q-D,CLK.UBCC,BYTE : CHECK
U 1287. 0000.013C.0180.0800.0000.102E :2233      Z?
U 102E. 0001.203D.0180.09E8.0000.1218 :2234      =0      ERROR2,RC[OD],Q
      :2235
      :2236
      :2237      :+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
      :2238      :-
      :2239
U 102F. 0810.0038.0180.0900.0000.1288 :2240      D_RC[0]      : GET BLEG DATA
U 1288. 0500.003C.0180.0800.0000.1289 :2241      D-D.LEFT,SI/ZERO      : SHIFT SO ZERO FLOATS TO NEXT BIT
U 1289. 0001.003C.0180.0980.0000.128A :2242      RC[0] D
U 128A. 0810.0038.0180.0960.0000.128B :2243      D_RC[0C]      : GET THE LOOP COUNT
U 128B. 0019.8000.0980.0800.0010.128C :2244      A[U-D-K[.2],CLK.UBCC,BYTE : TIME FOR A=B?
U 128C. 0000.013C.0180.0800.0000.1030 :2245      Z?
U 1030. 0000.003C.0180.0800.0000.128E :2246      =0      J/T146P2      : NO
U 1031. 0018.0038.1180.09F0.0000.128D :2247      RC[OE]_K[.4]      : SET EXPECTED VALUE
U 128D. 0003.003C.0180.0A90.0000.128E :2248      R[2] 0      : SET INITIAL VALUE
U 128E. 0019.8000.0580.09E0.0010.1290 :2249      T146P2: RC[0]_D-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
U 1290. 0000.013C.0180.0800.0000.1032 :2250      Z?
U 1032. 0000.003C.0180.0800.0000.102D :2251      =0      J/T146L2
      :2252
      :2253
      :2254      :////////////////////
      :2255      :+
      :2256      : Z BIT SETS WHEN A=B, DATA TYPE LONG
      :2257      :-
      :2258
U 1033. 0000.003C.0180.0A08.0000.1291 :2259      T146S3: LAB R[1]
U 1291. 0018.0014.1180.0A88.0000.1034 :2260      R[1] LA+K[.4]
U 1034. 0000.003D.0180.0800.0000.122F :2261      =0      SUBTEST
U 1035. 0018.0000.0580.0980.0000.1292 :2262      RC[0] 0-K[.1]      : INIT BLEG DATA
U 1292. 0018.0038.1180.0A90.0000.1293 :2263      R[2] R[.4]      : INITIAL VALUE OF Z BIT
U 1293. 0003.003C.0180.09F0.0000.1294 :2264      RC[OE] 0      : EXPECTED VALUE OF Z BIT
U 1294. 0818.0038.7580.0800.0000.1295 :2265      D K[.20]
U 1295. 0019.0014.0580.09E0.0000.1036 :2266      RC[0C] D+K[.1]      : SET THE LOOP COUNT
U 1036. 2000.003D.0180.0A08.4200.1235 :2267      =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 1037. 0000.003C.0180.0800.0000.1038 :2268      NOP
U 1038. 0000.003D.0180.0800.0000.1234 :2269      =0      CALL,J/DISPAT      : LOAD THE DATA TYPE LATCH
U 1039. 0000.003C.0180.0800.0000.103A :2270      NOP
U 103A. 0000.003D.0180.0800.0000.1215 :2271      =0      ERLOOP
U 103B. 0800.003C.0180.0A10.0000.1296 :2272      T146L3: D R[2]
U 1296. 0000.003C.3DF0.2C00.0000.1297 :2273      Q_ID[PSL]
U 1297. 0019.2024.61C0.0800.0000.1298 :2274      Q-Q.ANDNOT.K[F]
U 1298. 081D.0030.0180.0800.0000.1299 :2275      D-D.OR.Q
U 1299. 0000.003C.3D80.3E00.0000.129A :2276      ID[PSL] D,LAB_R[0]      : INIT THE Z BIT
U 129A. 0810.0038.0180.0970.0000.129B :2277      D_RC[OE]      : GET EXPECTED VALUE

```

U 129B, 0000,003C,0180,0900,0000,129C :2278
 U 129C, 0010,C014,0180,0800,0070,129D :2279
 U 129D, 0000,003C,3DF0,2C00,0000,129E :2280
 U 129E, 0019,2034,11C0,0800,0000,129F :2281
 U 129F, 001D,A000,0180,0800,0010,12A0 :2282
 U 12A0, 0000,013C,0180,0800,0000,103C :2283
 U 103C, 0001,203D,0180,09E8,0000,1218 :2284

LC RC[0] : LATCH THE BLEG DATA
 SYNCA2: ALD LA+LC,SET.CC(INST) : EXECUTE TEM TEST
 Q_ID[PSL]
 Q-Q.AND.K[.4] : MASK THE Z BIT
 ACU_Q-D,CLK.UBCC,BYTE : CHECK
 Z?
 =0 ERROR2,RC[0D]_Q

THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST

U 103D, 0810,0038,0180,0900,0000,12A1 :2290
 U 12A1, 0500,003C,0180,0800,0000,12A2 :2291
 U 12A2, 0001,003C,0180,0980,0000,12A3 :2292
 U 12A3, 0810,0038,0180,0960,0000,12A4 :2293
 U 12A4, 0019,8000,0980,0800,0010,12A5 :2294
 U 12A5, 0000,013C,0180,0800,0000,103E :2295
 U 103E, 0000,003C,0180,0800,0000,12A7 :2296
 U 103F, 0018,0038,1180,09F0,0000,12A6 :2297
 U 12A6, 0003,003C,0180,0A90,0000,12A7 :2298
 U 12A7, 0019,8000,0580,09E0,0010,12A8 :2299
 U 12A8, 0000,013C,0180,0800,0000,1040 :2300
 U 1040, 0000,003C,0180,0800,0000,103B :2301
 U 1041, 0000,003C,0180,0800,0000,1042 :2302

D_RC[0] : GET BLEG DATA
 D-D.LEFT,SI/ZERO : SHIFT SO ZERO FLOATS TO NEXT BIT
 RC[0] D
 D_RC[0C] : GET THE LOOP COUNT
 ACU_D-K[.2],CLK.UBCC,BYTE : TIME FOR A=B?
 Z?
 =0 J/T146P3 : NO
 RC[0E]_K[.4] : SET EXPECTED VALUE
 R[2] 0 : SET INITIAL VALUE
 T146P3: RC[0C]_D-K[.1],CLK.UBCC,BYTE : DECREMENT LOOP COUNT
 Z?
 =0 J/T146L3
 NOP

THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:

:X 100
 : SUBTST 1
 : \$ 6091,0050
 : SUBTST 2
 : \$ 6081,0050
 : SUBTST 3
 : \$ 60D1,0050

U 1042, 0018,0039,0980,09F8,0000,11FC
U 1043, 0818,0038,6580,0800,0000,1044
U 1044, 0819,0015,0580,0800,0000,121A
U 1045, 0001,003C,0180,0A88,0000,1046
U 1046, 0818,0039,2180,0800,0000,121A
U 1047, 0001,003C,0180,0A98,0000,12A9
U 12A9, 0818,0038,6580,0800,0000,1048
U 1048, 0819,0015,0980,0800,0000,121A
U 1049, 0001,003C,0180,0A90,0000,12AB
U 12AB, 0818,0038,7D80,0800,0000,104A
U 104A, 0819,0001,0980,0800,0000,121A
U 104B, 0001,003C,0180,0AA0,0000,104C

```
2313 PAGE 'TEST 147 INSTRUCTION DEPENDENT COND CODE LOAD (N BIT)'  
2314 *****  
2315 ++  
2316 TEST 147 INSTRUCTION DEPENDENT N BIT  
2317  
2318 TEST DESCRIPTION  
2319 THIS TEST CHECKS N SELECT CODES OF 1, 4, AND 5 WITH SELECTED  
2320 OP CODES IN THE INSTRUCTION BUFFER, AND SELECTED DATA PATTERNS  
2321 ON THE AMX AND BMX TO GENERATE THE CONDITIONS REQUIRED FOR THE  
2322 N DATA LOGIC.  
2323  
2324 SUBTST 1 - CHECK THAT THE N BIT CLEARS WITH N SELECT 4.  
2325 SUBTST 2 - CHECK N SELECT 5 WITH THOSE DATA PATTERNS REQUIRING  
2326 THE ALU TO EXECUTE AN AMX+BMX TO GENERATE THE REQUIRED  
2327 ALU DATA.  
2328 SUBTST 3 - CHECK N SELECT 5 WITH THOSE DATA PATTERNS REQUIRING  
2329 THE ALU TO EXECUTE AN AMX.AND.BMX TO GENERATE THE REQUIRED  
2330 ALU DATA.  
2331 SUBTST 4 - CHECK N SELECT 1 WITH A DATA TYPE QUAD TO CHECK THAT  
2332 THE ALU SIGN COMES FROM BIT 15.  
2333  
2334 LOGIC DESCRIPTION  
2335 THIS TEST CHECKS PART OF THE INSTRUCTION DEPENDENT CONDITION CODE  
2336 PROM, PART OF THE ZN PROM, THE ALU SIGN MULTIPLEXOR WITH QUAD DATA  
2337 TYPE, AND PART OF THE MULTIPLEXOR THAT FEEDS THE N DATA SIGNAL.  
2338  
2339 ERROR DESCRIPTION  
2340 DATA: EXPECTED CONDITION CODES  
2341 RECEIVED CONDITION CODES  
2342 LOOP COUNT - DESCRIBES WHICH DATA PATTERNS WERE BEING USED  
2343 WHEN THE FAILURE OCCURRED. (SEE THE DATA TABLE AT THE  
2344 END OF THIS TEST). NOT USED IN SUBTST 1.  
2345  
2346 SYNC POINT DESCRIPTION  
2347 SUBTST 1 - SYNC23--N BIT CLOCKS  
2348 SUBTST 2 - SYNC24--N BIT CLOCKS  
2349 SUBTST 3 - SYNC25--N BIT CLOCKS  
2350 SUBTST 4 - SYNC26--N BIT CLOCKS  
2351 --  
2352 *****  
2353 =0  
2354 T147: NEWTST[.2]  
2355 D_K[.10]  
2356 =0 D-D+K[.1],CALL,J/DCO : GEN ADR OF IB DATA 110  
2357 R[1]_D : SAVE  
2358 =0 D_K[.14],CALL,J/DCO : GEN ADR OF BMX DATA 140  
2359 R[3]_D : SAVE  
2360 D_K[.10]  
2361 =0 D-D+K[.2],CALL,J/DCO : GEN ADR OF AMX DATA 120  
2362 R[2]_D : SAVE  
2363 D_K[.18]  
2364 =0 D-D-K[.2],CALL,J/DCO : GEN ADR OF EXP N DATA 160  
2365 R[4]_D : SAVE  
2366  
2367 :////////////////////
```



```

:2368 :+
:2369 : NSEL<2:0>=LHM, PSL N_0
:2370 :-
:2371
:2372 =0
:2373 T147S1: CALL,J/GETDATA          : LOAD THE IB
:2374 RC[0E] 0                      : SET EXPECTED VALUE OF N
:2375 =0 SUBTEST
:2376 NOP
:2377 =0 ERLOOP
:2378 D_K[.8]
:2379 Q_ID[PSL]
:2380 Q_Q.ANDNOT.K[.F]
:2381 D_D.OR.Q
:2382 ID[PSL] D                      : SET N BIT
:2383 SYNC23: D_0,SET.CC(INST)        : EXECUTE TEST FUNCTION
:2384 Q_ID[PSL]
:2385 Q_Q.AND.K[.8]                  : MASK THE N BIT
:2386 A[U_Q-D,CLK.UBCC,BYTE         : CHECK
:2387 Z?
:2388 =0 ERROR2,RC[0D]_Q
:2389
:2390
:2391 :////////////////////
:2392 :+
:2393 : NSELECT<2:0>=LHL, ALU MUST DO AN AMX PLUS BMX TO GENERATE
:2394 : CORRECT ALU DATA
:2395 :-
:2396
:2397 T147S2: LAB R[1]
:2398 R[1] LA+K[.4]                  : INCREMENT ADR OF IB DATA
:2399 =0 SUBTEST
:2400 NOP
:2401 =0 SETRCF[.3]
:2402 RC[0C]_K[.4]                  : SET THE LOOP COUNT
:2403 =0
:2404 T147L1: CALL,J/GETDATA          : LOAD THE IB
:2405 NOP
:2406 =0 ERLOOP
:2407 NOP
:2408 =0 CALL,J/INITNBIT              : SET COMPLIMENT N BIT
:2409 SYNC24: ALU LA+LC,SET.CC(INST) : EXECUTE TEH TEST
:2410 Q_ID[PSL]
:2411 Q_Q.AND.K[.8]                  : MASK THE N BIT
:2412 A[U_Q-D,CLK.UBCC,BYTE         : CHECK
:2413 Z?
:2414 =0 ERROR2,RC[0D]_Q
:2415
:2416 :+
:2417 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2418 :-
:2419
:2420 LAB R[2]
:2421 R[2] LA+K[.4]                  : INCREMENT ADR OF AMX DATA
:2422 LAB R[3]

```

U 104C, 0000,003D,0180,0800,0000,123C
 U 104D, 0003,003C,0180,09F0,0000,1050
 U 1050, 0000,003D,0180,0800,0000,122F
 U 1051, 0000,003C,0180,0800,0000,1052
 U 1052, 0000,003D,0180,0800,0000,1215
 U 1053, 0818,0038,0180,0800,0000,12AC
 U 12AC, 0000,003C,3DF0,2C00,0000,12AD
 U 12AD, 0019,2024,61C0,0800,0000,12AE
 U 12AE, 081D,0030,0180,0800,0000,12AF
 U 12AF, 0000,003C,3D80,3C00,0000,12B0
 U 12B0, 0F00,C03C,0180,0800,0070,12B1
 U 12B1, 0000,003C,3DF0,2C00,0000,12B2
 U 12B2, 0019,2034,01C0,0800,0000,12B3
 U 12B3, 001D,A000,0180,0800,0010,12B4
 U 12B4, 0000,013C,0180,0800,0000,1054
 U 1054, 0001,203D,0180,09E8,0000,1218

U 1055, 0000,003C,0180,0A08,0000,12B5
 U 12B5, 0018,0014,1180,0A88,0000,1056
 U 1056, 0000,003D,0180,0800,0000,122F
 U 1057, 0000,003C,0180,0800,0000,1058
 U 1058, 0000,003D,0D80,0800,0084,7231
 U 1059, 0018,0038,1180,09E0,0000,105C

U 105C, 0000,003D,0180,0800,0000,123C
 U 105D, 0000,003C,0180,0800,0000,1060
 U 1060, 0000,003D,0180,0800,0000,1215
 U 1061, 0000,003C,0180,0800,0000,1062
 U 1062, 0000,003D,0180,0800,0000,1250
 U 1063, 0010,C014,0180,0800,0070,12B6
 U 12B6, 0000,003C,3DF0,2C00,0000,12B7
 U 12B7, 0019,2034,01C0,0800,0000,12B9
 U 12B9, 001D,A000,0180,0800,0010,12BA
 U 12BA, 0000,013C,0180,0800,0000,1064
 U 1064, 0001,203D,0180,09E8,0000,1218

U 1065, 0000,003C,0180,0A10,0000,12BC
 U 12BC, 0018,0014,1180,0A90,0000,12BD
 U 12BD, 0000,003C,0180,0A18,0000,12BE


```

U 12BE, 0018,0014,1180,0A98,0000,12BF :2423      R[3] LA+K[.4]          ; INCREMENT ADR OF BMX DATA
U 12BF, 0000,003C,0180,0A20,0000,12C0 :2424      LAB R[4]
U 12C0, 0018,0014,0580,0AA0,0000,12C1 :2425      R[4] LA+K[.1]          ; INCREMENT ADR OF EXP DATA
U 12C1, 0810,0038,0180,0960,0000,12C2 :2426      D RC[0C]
U 12C2, 0019,8000,0580,09E0,0010,12C3 :2427      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 12C3, 0000,013C,0180,0800,0000,1066 :2428      Z?
U 1066, 0000,003C,0180,0800,0000,105C :2429      =0 J/T147L1
:2430
:2431
:2432      ;////////////////////////////////////
:2433      ;+
:2434      ; NSELECT<2:0>=LHL, ALU MUST DO AMX .AND. BMX TO GET CORRECT ALU OUTPUT
:2435      ;-
:2436
U 1067, 0018,0038,0980,09E0,0000,1068 :2437      T147S3: RC[0C] K[.2]          ; SET THE LOOP COUNT
U 1068, 0000,003D,0180,0800,0000,122F :2438      =0 SUBTEST
U 1069, 0000,003C,0180,0800,0000,106A :2439      NOP
:2440      =0
:2441      T147L2: CALL,J/GETDATA          ; LOAD THE IB
U 106A, 0000,003D,0180,0800,0000,123C :2442      NOP
U 106B, 0000,003C,0180,0800,0000,106C :2443      =0 ERLOOP
U 106C, 0000,003D,0180,0800,0000,1215 :2444      NOP
U 106D, 0000,003C,0180,0800,0000,106E :2445      =0 CALL,J/INITNBIT          ; SET COMPLIMENT N BIT
U 106E, 0000,003D,0180,0800,0000,1250 :2446      SYNC25: ALU LA.AND.LC,SET.CC(INST) ; EXECUTE TEN TEST
U 106F, 0010,C034,0180,0800,0070,12C4 :2447      Q ID[PSL]
U 12C4, 0000,003C,3DF0,2C00,0000,12C5 :2448      Q-Q.AND.K[.8]          ; MASK THE N BIT
U 12C5, 0019,2034,01C0,0800,0000,12C6 :2449      A[U_Q-D,CLK.UBCC,BYTE ; CHECK
U 12C6, 001D,A000,0180,0800,0010,12C7 :2450      Z?
U 12C7, 0000,013C,0180,0800,0000,1070 :2451      =0 ERROR2,RC[0D]_Q
U 1070, 0001,203D,0180,09E8,0000,1218 :2452
:2453
:2454      ;+
:2455      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2456      ;-
:2457
U 1071, 0000,003C,0180,0A10,0000,12C8 :2457      LAB R[2]
U 12C8, 0018,0014,1180,0A90,0000,12C9 :2458      R[2] LA+K[.4]          ; INCREMENT ADR OF AMX DATA
U 12C9, 0000,003C,0180,0A18,0000,12CA :2459      LAB R[3]
U 12CA, 0018,0014,1180,0A98,0000,12CB :2460      R[3] LA+K[.4]          ; INCREMENT ADR OF BMX DATA
U 12CB, 0000,003C,0180,0A20,0000,12CC :2461      LAB R[4]
U 12CC, 0018,0014,0580,0AA0,0000,12CD :2462      R[4] LA+K[.1]          ; INCREMENT ADR OF EXP DATA
U 12CD, 0810,0038,0180,0960,0000,12CE :2463      D RC[0C]
U 12CE, 0019,8000,0580,09E0,0010,12CF :2464      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 12CF, 0000,013C,0180,0800,0000,1072 :2465      Z?
U 1072, 0000,003C,0180,0800,0000,106A :2466      =0 J/T147L2
:2467
:2468
:2469      ;////////////////////////////////////
:2470      ;+
:2471      ; NSELECT<2:0>=HHL -- DATA TYPE QUAD
:2472      ;-
:2473
U 1073, 0018,0038,0980,09E0,0000,1074 :2474      T147S4: RC[0C] K[.2]          ; SET THE LOOP COUNT
U 1074, 0000,003D,0180,0800,0000,122F :2475      =0 SUBTEST
U 1075, 0000,003C,0180,0A08,0000,12D0 :2476      LAB R[1]
U 12D0, 0018,0014,1180,0A88,0000,1076 :2477      R[1] LA+K[.4]          ; INCREMENT ADR OF IB DATA

```

```

U 1076, 0000,003D,0180,0800,0000,123C :2478 =0 CALL,J/GETDATA ; LOAD THE IB AND GET DATA FOR ALU
U 1077, 0000,003C,0180,0800,0000,1078 :2479 NOP
U 1078, 0000,003D,0180,0800,0000,1215 :2480 =0 ERLOOP ;
U 1079, 0000,003C,0180,0800,0000,107A :2481 T147L3: NOP
U 107A, 0000,003D,0180,0800,0000,1250 :2482 =0 CALL,J/INITNBIT ; SET THE COMPLIMENT N BIT
U 107B, 0010,C014,0180,0800,0070,12D1 :2483 SYNC26: ALU,LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 12D1, 0000,003C,3DF0,2C00,0000,12D2 :2484 Q_ID[PSL] ; GET THE CC'S
U 12D2, 0019,2034,01C0,0800,0000,12D3 :2485 Q-Q.AND.K[.8] ; MASK N BIT
U 12D3, 001D,A000,0180,0800,0010,12D4 :2486 A[U-Q-D,CLK.UBCC,BYTE ; CHECK RESULT
U 12D4, 0000,013C,0180,0800,0000,107C :2487 Z?
U 107C, 0001,203D,0180,09E8,0000,1218 :2488 =0 ERROR2,RC[0D],Q
:2489
:2490
:2491
:2492
:2493

```

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:2494
:2495
:2496
:2497
:2498
:2499
:2500
:2501
:2502
:2503
:2504
:2505
:2506
:2507
:2508
:2509
:2510
:2511
:2512
:2513
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```

```

U 107D, 0000,003C,0180,0A10,0000,12D5 :2494 LAB R[2]
U 12D5, 0018,0014,1180,0A90,0000,12D6 :2495 R[2],LA+K[.4] ; INCREMENT ADR OF AMX DATA
U 12D6, 0000,003C,0180,0A20,0000,12D7 :2496 LAB R[4]
U 12D7, 0018,0014,0580,0AA0,0000,12D8 :2497 R[4],LA+K[.1] ; INCREMENT ADR OF EXPECTED DATA
U 12D8, 0810,0038,0180,0960,0000,12D9 :2498 D RC[0C]
U 12D9, 0019,8000,0580,09E0,0010,12DA :2499 R[0C],D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 12DA, 0000,013C,0180,0800,0000,107E :2500 Z?
U 107E, 0000,003C,0180,0800,0000,1079 :2501 =0 J/T147L3 ; CONTINUE
U 107F, 0000,003C,0180,0800,0000,1080 :2502 NOP
:2503
:2504
:2505
:2506
:2507
:2508
:2509
:2510
:2511
:2512
:2513
:2514
:2515
:2516
:2517
:2518
:2519
:2520
:2521
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:2530
:2531
:2532

```

: THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:

```

:Z 110
: SUBTST 1
:$ 5028,0000
: SUBTST 2 AND 3
:$ 6091,0050
: SUBTST 4
:$ 6070,0050

```

: THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:

```

:Z 120
: SUBTST 2, LOOP COUNT 4 THRU 1
:$ 0000,0000
:$ 0040,0000
:$ 0080,0000
:$ 0000,0000
: SUBTST 3, LOOP COUNT 2 THRU 1
:$ 0080,0000
:$ 0080,0000
: SUBTST 4, LOOP COUNT 2 THRU 1
:$ 8000,0000
:$ 0080,8000

```

: THE FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:

```

:Z 140
: SUBTST 2, LOOP COUNT 4 THRU 1
:$ 0080,0000
:$ 0040,0000

```

```

:2533      :$ 0080,0000
:2534      :$ 0000,0000
:2535      : SUBST 3, LOOP COUNT 2 THRU 1
:2536      :$ 0080,0000
:2537      :$ 0000,0000
:2538      : SUBST 4, LOOP COUNT 2 AND 1
:2539      :$ 0000,0000
:2540      :
:2541      : THE FOLLOWING IS THE EXPECTED N BIT FOR THE ABOVE TEST:
:2542      :X 160
:2543      :$ 0008,0808,0000,0008
:2544

```

```

:2545 PAGE 'TEST 148 CM CONDITION CODE LOAD = 4'
:2546 *****
:2547 ++
:2548 TEST 148 CM CONDITION CODE LOAD = 4
:2549
:2550 TEST DESCRIPTION
:2551 THIS TEST CHECKS THAT EACH OF THE CONDITION CODES GETS LOADED
:2552 WITH THE CORRECT DATA WITH A UCCK FIELD OF 4.
:2553
:2554 SUBTST 1 - CHECK THAT THE Z BIT SETS AND THAT THE C, V, AND N BITS
:2555 CLEAR WITH AMX AND ALU DATA EQUAL TO ZERO.
:2556 SUBTST 2 - CHECK THAT THE C AND N BIT SET AND THAT THE V AND Z BIT
:2557 CLEAR WITH AMX AND ALU DATA OF 'EF'.
:2558
:2559 LOGIC DESCRIPTION
:2560 THIS TEST CHECKS THAT N SELECT=1, Z SELECT=3, V SELECT=5, AND
:2561 C SELECT=4 SIGNALS ALONG WITH AMX BIT 00, ALU=0
:2562 AND THE INVERTED ALU SIGN ARE FED TO THE N, Z, V, AND C DATA SIGNALS
:2563 CORRECTLY.
:2564
:2565 ERROR DESCRIPTION
:2566 DATA: EXPECTED CONDITION CODES
:2567 RECEIVED CONDITION CODES
:2568
:2569 SYNC POINT DESCRIPTION
:2570 SUBTST 1 - SYNC04--CONDITION CODES ARE CLOCKED
:2571 SUBTST 2 - SYNC05--CONDITION CODES ARE CLOCKED
:2572 --
:2573 *****
:2574 =0
U 1080, 0018,0039,0980,09F8,0000,11FC :2575 T148: NEWTST[.2]
:2576
:2577 :////////////////////
:2578 :+
:2579 : CHECK THAT THE Z BIT SETS AND THAT N,V, AND C CLEAR
:2580 :-
:2581
:2582 T148S1: RC[0] 0 : INITIALIZE AMX DATA
:2583 =0 SUBTEST
:2584 RC[OE]_K[.4] : INIT EXPECTED VALUE OF CC'S
:2585 =0 ERLOOP
:2586 D_K[.A]
:2587 D-D+K[.1]
:2588 ID[PSL] D : INIT THE CC'S
:2589 =0 CALL J/SETCM : SET THE CM BIT
:2590 D RC[OE] : GET EXPECTED CC'S
:2591 SYNC04: AEU RC[0], SET.CC(ROR) : EXECUTE THE TEST
:2592 Q_ID[PSL] : READ THE CC'S
:2593 Q-Q.AND.K[.F] : MASK
:2594 AEU_Q-D,CLK.UBCC,BYTE : CHECK
:2595 Z?
:2596 =0 ERROR1,RC[OD]_Q : CC'S FAILED
:2597
:2598 :////////////////////
:2599 :+

```



```

:2600 ; CHECK THAT N AND C SET AND THAT Z AND V CLEAR
:2601 :-
:2602
U 1089, 0018,0038,3D80,0A80,0000,108A :2603 T148S2: RC[0] K[.EF] ; INIT AMX DATA
U 108A, 0000,003D,0180,0800,0000,122F :2604 =0 SUBTEST
U 108B, 0018,0038,D980,09F0,0000,108C :2605 RC[0E] K[.9] ; INIT EXPECTED CC'S
U 108C, 0000,003D,0180,0800,0000,1215 :2606 =0 ERLOOP
U 108D, 0818,0038,D580,0800,0000,12E2 :2607 D K[.6]
U 12E2, 0000,003C,3D80,3C00,0000,108E :2608 ID[PSL] D ; INIT THE CC'S
U 108E, 0000,003D,0180,0800,0000,125B :2609 =0 CALL J/SETCM ; SET THE CM BIT
U 108F, 0810,0038,0180,0970,0000,12E3 :2610 D RC[0E] ; GET EXPECTED CC'S
U 12E3, 0000,803C,0180,0A00,0040,12E4 :2611 SYNC05: ACU RC[0],SET.CC(ROR),BYTE ; EXECUTE THE TEST
U 12E4, 0000,003C,3DF0,2C00,0000,12E5 :2612 Q ID[PSL] ; READ TEN CC'S
U 12E5, 0019,2034,61C0,0800,0000,12E6 :2613 Q-Q.AND.K[.F] ; MASK
U 12E6, 001D,A000,0180,0800,0010,12E7 :2614 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 12E7, 0000,013C,0180,0800,0000,1090 :2615 Z?
U 1090, 0001,203D,0180,09E8,0000,1216 :2616 =0 ERROR1,RC[0D]_Q ; CC'S FAILED
U 1091, 0000,003C,0180,0800,0000,1092 :2617 NOP
:2618
:2619

```

```

:2620 .PAGE 'TEST 149 CM CONDITION CODE LOAD = 5 (Z BIT)'
:2621 *****
:2622 ++
:2623 .TEST 149 CM CONDITION CODE LOAD = 5 (Z BIT)
:2624
:2625 .TEST DESCRIPTION
:2626 THIS TEST CHECKS THAT THE Z BIT IS SET OR CLEARED FROM THE ALU=0
:2627 DETECT FOR A UCCK FIELD EQUAL TO 5.
:2628
:2629 SUBTST 1 - CHECK THAT THE Z BIT CLEARS
:2630 SUBTST 2 - CHECK THAT THE Z BIT SETS
:2631
:2632 .LOGIC DESCRIPTION
:2633 THIS TEST CHECKS THE Z SELECT CODE = 3, FROM THE ZN PROM, AND PART OF
:2634 THE Z DATA MULTIPLEXOR ON THE CEH MODULE.
:2635
:2636 .ERROR DESCRIPTION
:2637 DATA: EXPECTED CONDITION CODES
:2638 RECEIVED CONDITION CODES
:2639
:2640 .SYNC POINT DESCRIPTION
:2641 SUBTST 1 - SYNC06--Z BIT IS LOADED
:2642 SUBTST 2 - SYNC07--Z BIT IS LOADED
:2643 --
:2644 *****
:2645 =0
U 1092, 0018,0039,0980,09F8,0000,11FC :2646 T149: NEWTST[.2]
:2647
:2648 //////////////////////////////////////
:2649 +
:2650 .CHECK THAT THE Z BIT SETS WHEN THE ALU=0
:2651 -
:2652
:2653 T149S1: RC[0] 0 ; INIT ALU DATA
:2654 =0 SUBTEST
:2655 RC[OE]_K[.4] ; INIT THE EXPECTED DATA
:2656 =0 ERLOOP
:2657 D 0
:2658 ID[PSL] D ; INIT THE Z BIT
:2659 =0 CALL J/SETCM ; SET THE CM BIT
:2660 D RC[OE] ; GET THE EXPECTED DATA
:2661 SYNC06: ALU RC[0], SET.N&Z ; EXECUTE THE TEST
:2662 Q_ID[PSL] ; READ THE Z BIT
:2663 Q-Q.AND.K[.4] ; MASK
:2664 ALU-Q-D,CLK.UBCC,BYTE ; CHECK
:2665 Z?
:2666 =0 ERROR1,RC[0D]_Q ; Z BIT FAILED
:2667
:2668 //////////////////////////////////////
:2669 +
:2670 .CHECK THAT THE Z BIT CLEARS WHEN THE ALU.NE.0
:2671 -
:2672
:2673 T149S2: RC[OE] 0
U 109B, 0003,003C,0180,09F0,0000,109C :2674 =0 SUBTEST
U 109C, 0000,003D,0180,0800,0000,122F

```

Address	Instruction	Comment
U 109D	0018,0038,0580,0A80,0000,109E	:2675 R[0] K[.1]
U 109E	0000,003D,0180,0800,0000,1215	:2676 =0 ERLOOP
U 109F	0818,0038,1180,0800,0000,12EE	:2677 D K[.4]
U 12EE	0000,003C,3D80,3C00,0000,10A0	:2678 ID[PSL] D
U 10A0	0000,003D,0180,0800,0000,125B	:2679 =0 CALL J/SETCM
U 10A1	0810,0038,0180,0970,0000,12EF	:2680 D RC[OE]
U 12EF	0000,803C,0180,0A00,0050,12F0	:2681 SYNC07: A[U R[0],SET.N&Z,BYTE
U 12F0	0000,003C,3DF0,2C00,0000,12F1	:2682 Q ID[PSL]
U 12F1	0019,2034,11C0,0800,0000,12F2	:2683 Q-Q.AND.K[.4]
U 12F2	001D,A000,0180,0800,0010,12F3	:2684 A[U-Q-D,CLK.UBCC,BYTE
U 12F3	0000,013C,0180,0800,0000,10A2	:2685 Z?
U 10A2	0001,203D,0180,09E8,0000,1216	:2686 =0 ERROR1,RC[OD]_Q
U 10A3	0000,003C,0180,0800,0000,10A4	:2687 NOP
		:2688
		:2689

```

:2690 .PAGE 'TEST 14A CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)'
:2691 *****
:2692 ++
:2693 TEST 14A CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)
:2694
:2695 TEST DESCRIPTION
:2696 THIS TEST CHECKS THAT THE C BIT IS LOADED FROM AMX00, THE Z BIT
:2697 IS LOADED FROM ITSELF, AND THE N BIT IS LOADED FROM ITSELF WHEN
:2698 THE UCCK FIELD = 6.
:2699
:2700 SUBTST 1 - CHECK THAT THE C, Z, AND N BITS CLEAR
:2701 SUBTST 2 - CHECK THAT THE C, Z, AND N BITS SET
:2702
:2703 LOGIC DESCRIPTION
:2704 THIS TEST CHECKS C SELECT=4, Z SELECT=0, AND N SELECT=0 FROM
:2705 THE ZN AND CV PROMS, AND PART OF THE MULTIPLEXORS FOR THE C, Z, AND
:2706 N DATA SIGNALS ON THE CEM MODULE.
:2707
:2708 ERROR DESCRIPTION
:2709 DATA: EXPECTED CONDITION CODES
:2710 RECEIVED CONDITION CODES
:2711
:2712 SYNC POINT DESCRIPTION
:2713 SUBTST 1 - SYNC08--CONDITION CODES ARE LOADED
:2714 SUBTST 2 - SYNC09--CONDITION CODES ARE LOADED
:2715 --
:2716 *****
:2717 =0
U 10A4, 0018,0039,0980,09F8,0000,11FC :2718 T14A: NEWTST[.2]
:2719
:2720 :////////////////////
:2721 :+
:2722 : CHECK THAT THE C, Z, AND N BITS CLEAR
:2723 :-
:2724
U 10A5, 0003,003C,0180,0A80,0000,10A6 :2725 T14AS1: RC[0] 0 ; INIT AMX DATA
U 10A6, 0000,003D,0180,0800,0000,122F :2726 =0 SUBTEST
U 10A7, 0003,003C,0180,09F0,0000,10A8 :2727 RC[OE] 0 ; INIT EXPECTED DATA
U 10A8, 0000,003D,0180,0800,0000,1215 :2728 =0 ERLOOP
U 10A9, 0818,0038,0580,0800,0000,12F4 :2729 D K[.1]
U 12F4, 0000,003C,3D80,3C00,0000,10AA :2730 ID[PSL] D ; INIT THE CC'S
U 10AA, 0000,003D,0180,0800,0000,125B :2731 =0 CALL J/SETCM ; SET THE CM BIT
U 10AB, 0810,0038,0180,0970,0000,12F5 :2732 D RC[OE] ; GET THE EXPECTED DATA
U 12F5, 0000,803C,0180,0A00,0060,12F6 :2733 SYNC08: ACU RC[0],SET.PSL.C(AMX),BYTE ; EXECUTE THE TEST
U 12F6, 0000,003C,3DF0,2C00,0000,12F7 :2734 Q ID[PSL] ; GET THE CC'S
U 12F7, 0019,2034,89C0,0800,0000,12F8 :2735 Q-Q.AND.K[D] ; MASK
U 12F8, 001D,A000,0180,0800,0010,12F9 :2736 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 12F9, 0000,013C,0180,0800,0000,10AC :2737 Z?
U 10AC, 0001,203D,0180,09E8,0000,1216 :2738 =0 ERROR1,RC[OD]_Q ; CC'S FAILED
:2739
:2740 :////////////////////
:2741 :+
:2742 : CHECK THAT THE C, Z, AND N BITS SET
:2743 :-
:2744
```


ZZ-ESKAH-V132 TEST 14A CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS) L 4
ESKAH39.MCR MICRO2 1M(01) 16-DEC-82 12:30:35

SEQ 1076
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U 10AD, 0018,0038,0580,0A80,0000,10AE :2745 T14AS2: RC[0] K[.1] ; SET THE AMX DATA
U 10AE, 0000,003D,0180,0800,0000,122F :2746 =0 SUBTEST
U 10AF, 0018,0038,8980,09F0,0000,10B0 :2747 RC[0E] K[.D] ; SET THE EXPECTED DATA
U 10B0, 0000,003D,0180,0800,0000,1215 :2748 =0 ERLOOP
U 10B1, 0818,0038,8580,0800,0000,12FA :2749 D K[.C]
U 12FA, 0000,003C,3D80,3C00,0000,10B2 :2750 ID[PSL] D ; INIT THE CC'S
U 10B2, 0000,003D,0180,0800,0000,125B :2751 =0 CALL J/SETCM ; SET THE CM BIT
U 10B3, 0810,0038,0180,0970,0000,12FB :2752 D RC[0E] ; GET THE EXPECTED VALUES
U 12FB, 0000,003C,0180,0A00,0060,12FC :2753 SYNC09: ACU RC[0], SET.PSL.C(AMX) ; EXECUTE THE TEST
U 12FC, 0000,003C,3DF0,2C00,0000,12FD :2754 Q ID[PSL] ; READ THE CC'S
U 12FD, 0019,2034,89C0,0800,0000,12FE :2755 Q-Q.AND.K[.D] ; MASK
U 12FE, 001D,A000,0180,0800,0010,12FF :2756 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 12FF, 0000,013C,0180,0800,0000,10B4 :2757 Z?
U 10B4, 0001,203D,0180,09E8,0000,1216 :2758 =0 ERROR1,RC[0D]_Q ; CC'S FAILED
U 10B5, 0000,003C,0180,0800,0000,10B6 :2759 NOP
:2760
:2761
```

```

2762 .PAGE 'TEST 14B CM CONDITION CODE LOAD = 6 (V BIT)'
2763 *****
2764 ++
2765 TEST 14B CM CONDITION CODE LOAD = 6 (V BIT)
2766
2767 TEST DESCRIPTION
2768 THIS TEST CHECKS THAT THE V BIT SETS AND CLEARS PROPERLY
2769 WHEN THE UCCK FIELD EQUALS 6. THE EQUATION FOR THE V DATA SIGNAL
2770 IS:
2771 -ALU SIGN*PSL C(1) + ALU SIGN*PSL C(0)
2772
2773 SUBTST 1 - CHECK THAT THE V BIT CLEARS DUE TO ALU SIGN FALSE AND
2774 PSL C IS CLEAR.
2775 SUBTST 2 - CHECK THAT THE V BIT SETS DUE TO ALU SIGN FALSE AND
2776 PSL C SET.
2777 SUBTST 3 - CHECK THAT THE V BIT SETS DUE TO ALU SIGN TRUE AND
2778 PSL C CLEAR.
2779 SUBTST 4 - CHECK THAT THE V BIT CLEARS DUE TO ALU SIGN TRUE AND
2780 PSL C SET.
2781
2782 LOGIC DESCRIPTION
2783 THIS TEST CHECKS THE V SELECT = 4 AND THE GATES THAT FEED THE V DATA
2784 DATA SIGNAL FOR THIS CONDITION, ON THE CEM MODULE.
2785
2786 ERROR DESCRIPTION
2787 DATA: EXPECTED CONDITION CODES
2788 RECEIVED CONDITION CODES
2789
2790 SYNC POINT DESCRIPTION
2791 SUBTST 1 - SYNCOA--V BIT IS CLOCKED
2792 SUBTST 2 - SYNCOB--V BIT IS CLOCKED
2793 SUBTST 3 - SYNCOC--V BIT IS CLOCKED
2794 SUBTST 4 - SYNCOD--V BIT IS CLOCKED
2795
2796 *****
2797 =0
2798 T14B: NEWTST[.2]
2799
2800 //////////////////////////////////////
2801 +
2802 CHECK THAT V BIT CLEARS DUE TO -ALU SIGN*-PSL C
2803 -
2804
2805 T14BS1: RC[0] 0 ; INIT THE ALU SIGN BIT
2806 =0 SUBTEST
2807 RC[OE] 0 ; INIT THE EXPECTED DATA
2808 =0 ERLOOP
2809 D 0
2810 ID[PSL] 0 ; INIT THE V BIT
2811 =0 CALL J/SETCM ; SET THE CM BIT
2812 D RC[OE] ; GET TEN EXPECTED V BIT
2813 SYNCOA: ACU RC[0], SET.PSL.C(AMX) ; EXECUTE THE TEST
2814 Q ID[PSL] ; READ THE V BIT
2815 Q-Q.AND.K[.2] ; MASK
2816 ACU Q-D.CLK.UBCC.BYTE ; CHECK
  
```

U 10B6, 0018,0039,0980,09F8,0000,11FC

U 10B7, 0003,003C,0180,0A80,0000,10B8
 U 10B8, 0000,003D,0180,0800,0000,122F
 U 10B9, 0003,003C,0180,09F0,0000,10BA
 U 10BA, 0000,003D,0180,0800,0000,1215
 U 10BB, 0F00,003C,0180,0800,0000,1300
 U 1300, 0000,003C,3D80,3C00,0000,10BC
 U 10BC, 0000,003D,0180,0800,0000,125B
 U 10BD, 0810,0038,0180,0970,0000,1301
 U 1301, 0000,003C,0180,0A00,0060,1302
 U 1302, 0000,003C,3DF0,2C00,0000,1303
 U 1303, 0019,2034,09C0,0800,0000,1304
 U 1304, 001D,A000,0180,0800,0010,1305

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U 1305, 0000,013C,0180,0800,0000,10BE :2817
U 10BE, 0001,203D,0180,09E8,0000,1216 :2818
:2819
:2820
:2821
:2822
:2823
:2824
:2825 T14BS2: RC[OE] K[.2] : SET THE EXPECTED V BIT
:2826 =0 SUBTEST
:2827 NOP
:2828 =0 ERLOOP
:2829 D K[.1]
:2830 ID[PSL] D : INIT THE V BIT
:2831 =0 CALL J/SETCM : SET THE CM BIT
:2832 D RC[OE] : GET THE EXPECTED VALUE OF V BIT
:2833 SYNCOB: A[U,RC],SET.PSL.C(AMX) : EXECUTE TEN TEST
:2834 Q ID[PSL] : READ THE CC'S
:2835 Q-Q.AND.K[.2] : MASK THE V BIT
:2836 A[U,Q-D,CLK,UBCC,BYTE] : CHECK
:2837 Z?
:2838 =0 ERROR1,RC[OD],Q : V BIT FAILED
:2839
:2840
:2841
:2842
:2843
:2844
:2845 T14BS3: R[0] K[.80] : INIT THE ALU DATA
:2846 =0 SUBTEST
:2847 RC[OE] K[.2] : INIT THE EXPECTED V BIT
:2848 =0 ERLOOP
:2849 D 0
:2850 ID[PSL] D : INIT THE V BIT
:2851 =0 CALL J/SETCM : SET THE CM BIT
:2852 D RC[OE] : GET EXPECTED V BIT
:2853 SYNCOC: A[U,RC],SET.PSL.C(AMX),BYTE : EXECUTE THE TEST
:2854 Q ID[PSL] : READ THE V BIT
:2855 Q-Q.AND.K[.2] : MASK
:2856 A[U,Q-D,CLK,UBCC,BYTE] : CHECK
:2857 Z?
:2858 =0 ERROR1,RC[OD],Q : V BIT FAILED
:2859
:2860
:2861
:2862
:2863
:2864
:2865 T14BS4: RC[OE] 0 : INIT THE EXPECTED DATA
:2866 =0 SUBTEST
:2867 NOP
:2868 =0 ERLOOP
:2869 D K[.3]
:2870 ID[PSL] D : INIT THE V BIT
:2871 =0 CALL J/SETCM : SET THE CM BIT

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0000000000000000

U 10D5.	0810,0038,0180,0970,0000,1313	:2872
U 1313.	0000,803C,0180,0A00,0060,1314	:2873
U 1314.	0000,003C,3DF0,2C00,0000,1315	:2874
U 1315.	0019,2034,09C0,0800,0000,1316	:2875
U 1316.	001D,A000,0180,0800,0010,1317	:2876
U 1317.	0000,013C,0180,0800,0000,10D6	:2877
U 10D6.	0001,203D,0180,09E8,0000,1216	:2878
U 10D7.	00C0,003C,0180,0800,0000,10D8	:2879
		:2880
		:2881

```

D R[OE]
SYNCD: A[U R[O],SET.PSL.C(AMX),BYTE
      Q_ID[PSL]
      Q-Q.AND.K[.2]
      A[U_Q-D,CLK.UBCC,BYTE
      Z?
=0    ERROR1,R[OD],_Q
      NOP

```

```

: GET EXPECTED V BIT
: EXECUTE THE TEST
: READ THE V BIT
: MASK
: CHECK
:
: V BIT FAILED

```

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```
.2882 PAGE 'TEST 14C CM INSTRUCTION DEPENDENT COND CODE LOAD'
.2883 *****
.2884 **
.2885 TEST 14C CM INSTRUCTION DEPENDENT COND CODE LOAD
.2886
.2887 TEST DESCRIPTION
.2888 THIS TEST CHECKS THOSE FUNCTIONS OF THE CONDITION CODES THAT WERE
.2889 NOT TESTED IN PREVIOUS TESTS AND REQUIRE A UCCK FIELD OF 7.
.2890 THE INSTRUCTION BUFFER IS LOADED WITH SPECIFIC OP CODES TO GENERATE
.2891 THE APPROPRIATE ADDRESSES ON THE CONDITION CODE PROMS, AND TO SELECT
.2892 THE APPROPRIATE DATA TYPE.
.2893
.2894 SUBTST 1 - CHECK C SELECT = 2 WITH ALU.NE.0
.2895 SUBTST 2 - CHECK C SELECT = 2 WITH ALU=0
.2896 SUBTST 3 - CHECK C SELECT = 6 WITH AMX SIGN=0
.2897 SUBTST 4 - CHECK C SELECT = 6 WITH AMX SIGN.NE.0
.2898 SUBTST 5 - CHECK VSELECT=1 WITH ALU SIGN*-AMX SIGN
.2899 SUBTST 6 - CHECK VSELECT=1 WITH ALU SIGN*AMX SIGN
.2900 SUBTST 7 - CHECK VSELECT=1 WITH -ALU SIGN*-AMX SIGN
.2901 SUBTST 8 - CHECK VSELECT=2 WITH PSL V SET
.2902 SUBTST 9 - CHECK VSELECT=2 WITH PSL V CLEAR
.2903 SUBTST A - CHECK VSELECT=4 WITH -ALU SIGN*PSL C
.2904 SUBTST B - CHECK VSELECT=5 WITH V DETECT SW TRUE
.2905 SUBTST C - CHECK Z SELECT = 4
.2906 SUBTST D - CHECK N SELECT = 1 WITH -ALU SIGN*INV ALU SIGN
.2907 SUBTST E - CHECK N SELECT = 1 WITH ALU SIGN*INV ALU SIGN
.2908 SUBTST F - CHECK C SELECT = 7
.2909
.2910 LOGIC DESCRIPTION
.2911 THIS TEST CHECKS PART OF THE CM INSTRUCTION DEPENDENT PROM, PART OF
.2912 THE CV AND ZN PROMS, AND PART OF THE LOGIC THAT FEEDS THE C, V,
.2913 Z, AND N DATA SIGNALS ON THE CEH MODULE.
.2914
.2915 ERROR DESCRIPTION
.2916 DATA: EXPECTED CONDITION CODES
.2917 RECEIVED CONDITION CODES
.2918
.2919 SYNC POINT DESCRIPTION
.2920 SUBTST 1 - SYNC0E--CONDITION CODES ARE CLOCKED
.2921 SUBTST 2 - SYNC0F--CONDITION CODES ARE CLOCKED
.2922 SUBTST 3 - SYNC10--CONDITION CODES ARE CLOCKED
.2923 SUBTST 4 - SYNC11--CONDITION CODES ARE CLOCKED
.2924 SUBTST 5 - SYNC12--CONDITION CODES ARE CLOCKED
.2925 SUBTST 6 - SYNC13--CONDITION CODES ARE CLOCKED
.2926 SUBTST 7 - SYNC14--CONDITION CODES ARE CLOCKED
.2927 SUBTST 8 - SYNC15--CONDITION CODES ARE CLOCKED
.2928 SUBTST 9 - SYNC16--CONDITION CODES ARE CLOCKED
.2929 SUBTST A - SYNC17--CONDITION CODES ARE CLOCKED
.2930 SUBTST B - SYNC18--CONDITION CODES ARE CLOCKED
.2931 SUBTST C - SYNC19--CONDITION CODES ARE CLOCKED
.2932 SUBTST D - SYNC1A--CONDITION CODES ARE CLOCKED
.2933 SUBTST E - SYNC1B--CONDITION CODES ARE CLOCKED
.2934 SUBTST F - SYNC1C--CONDITION CODES ARE CLOCKED
.2935
.2936 *****
```

```

:2937 =0
U 10D8, 0018,0039,0980,09F8,0000,11FC :2938 T14C: NEWTST[.2]
U 10D9, 0003,003C,0180,0A88,0000,1318 :2939 R[1]_0 ; INIT ADR OF IB DATA
:2940
:2941 :////////////////////
:2942 :+
:2943 : C BIT CSEL<2:0>=HLH, PSL C_ALU=0
:2944 :-
:2945
U 1318, 0003,003C,0180,0A80,0000,10DA :2946 T14CS1: R[0] 0 ; INIT THE ALU DATA
U 10DA, 0000,003D,0180,0800,0000,122F :2947 =0 SUBTEST
U 10DB, 0003,003C,0180,09F0,0000,10DC :2948 RC[OE]_0 ; INIT EXPECTED CC'S
U 10DC, 0000,003D,0180,0800,0000,1215 :2949 =0 ERLOOP
U 10DD, 0818,0038,0580,0800,0000,10DE :2950 D_K[.1]
U 10DE, 2000,003D,0180,0A08,4200,1235 :2951 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DF, 0000,003C,3DF0,2C00,0000,1319 :2952 Q_ID[PSL]
U 1319, 0019,2024,61C0,0800,0000,131A :2953 Q-Q.ANDNOT.K[F]
U 131A, 081D,0030,0180,0800,0000,131B :2954 D-D.OR.Q
U 131B, 0000,003C,3D80,3C00,0000,10E0 :2955 ID[PSL] D ; INIT THE C BIT
U 10E0, 0000,003D,0180,0800,0000,125B :2956 =0 CALL,J/SETCM ; SET THE CM BIT
U 10E1, 0810,0038,0180,0970,0000,131C :2957 D_RC[OE] ; GET EXPECTED C BIT
U 131C, 0000,C03C,0180,0A00,0070,131D :2958 SYNCOE: ACU R[0],SET.CC(INST) ; EXECUTE THE TEST
U 131D, 0000,003C,3DF0,2C00,0000,131E :2959 Q_ID[PSL] ; GET THE C BIT
U 131E, 0019,2034,05C0,0800,0000,131F :2960 Q-Q.AND.K[.1] ; MASK
U 131F, 001D,A000,0180,0800,0010,1320 :2961 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1320, 0000,013C,0180,0800,0000,10E2 :2962 Z?
U 10E2, 0001,203D,0180,09E8,0000,1218 :2963 =0 ERROR2,RC[OD]_Q ; C BIT FAILED
:2964
:2965 :////////////////////
:2966 :+
:2967 : CHECK THAT THE C BIT SETS
:2968 :-
:2969
U 10E3, 0018,0038,C180,0A80,0000,10E4 :2970 T14CS2: R[0] K[.FFFF] ; INIT ALU DATA
U 10E4, 0000,003D,0180,0800,0000,122F :2971 =0 SUBTEST
U 10E5, 0018,0038,0580,09F0,0000,10E6 :2972 RC[OE]_K[.1] ; INIT C EXPECTED
U 10E6, 0000,003D,0180,0800,0000,1215 :2973 =0 ERLOOP
U 10E7, 0F00,003C,0180,0800,0000,10E8 :2974 D 0
U 10E8, 2000,003D,0180,0A08,4200,1235 :2975 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10E9, 0000,003C,3DF0,2C00,0000,1321 :2976 Q_ID[PSL]
U 1321, 0019,2024,61C0,0800,0000,1322 :2977 Q-Q.ANDNOT.K[F]
U 1322, 081D,0030,0180,0800,0000,1323 :2978 D-D.OR.Q
U 1323, 0000,003C,3D80,3C00,0000,10EA :2979 ID[PSL] D ; INIT THE C BIT
U 10EA, 0000,003D,0180,0800,0000,125B :2980 =0 CALL,J/SETCM ; SET THE CM BIT
U 10EB, 0810,0038,0180,0970,0000,10EC :2981 D_RC[OE] ; GET THE EXPECTED VALUE
U 10EC, 0000,003D,0180,0800,0000,1234 :2982 =0 CALL,J/DISPAT ; LATCH THE DATA TYPE
U 10ED, 0000,C03C,0180,0A00,0070,1324 :2983 SYNCOF: ALU R[0],SET.CC(INST) ; EXECUTE THE TEST
U 1324, 0000,003C,3DF0,2C00,0000,1325 :2984 Q_ID[PSL] ; GET THE C BIT
U 1325, 0019,2034,05C0,0800,0000,1326 :2985 Q-Q.AND.K[.1] ; MASK
U 1326, 001D,A000,0180,0800,0010,1327 :2986 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1327, 0000,013C,0180,0800,0000,10EE :2987 Z?
U 10EE, 0001,203D,0180,09E8,0000,1218 :2988 =0 ERROR2,RC[OD]_Q ; C BIT FAILED
:2989
:2990 :////////////////////
:2991 :+

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:2992 ; CSEL<2:0>=LLH, PSL C_AMX SIGN L
:2993 ; -
:2994
U 10EF, 0000,003C,0180,0A08,0000,10F0 :2995 T14CS3: LAB R[1]
U 10F0, 0000,003D,0180,0800,0000,122F :2996 =0 SUBTEST
U 10F1, 0018,0014,0980,0A88,0000,1328 :2997 R[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
U 1328, 0003,003C,0180,0A80,0000,1329 :2998 R[0] 0 ; INIT AMX DATA
U 1329, 0018,0038,0580,0980,0000,132A :2999 RC[0] K[.1] ; INIT BMX DATA
U 132A, 0003,003C,0180,09F0,0000,10F2 :3000 RC[OE] 0 ; INIT EXPECTED C BIT
U 10F2, 0000,003D,0180,0800,0000,1215 :3001 =0 ERLOOP
U 10F3, 0818,0038,0580,0800,0000,10F4 :3002 D K[.1]
U 10F4, 2000,003D,0180,0A08,4200,1235 :3003 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F5, 0000,003C,3DF0,2C00,0000,132B :3004 Q ID[PSL]
U 132B, 0019,2024,61C0,0800,0000,132C :3005 Q-Q.ANDNOT.K[F]
U 132C, 081D,0030,0180,0800,0000,132D :3006 D-D.OR.Q
U 132D, 0000,003C,3D80,3C00,0000,10F6 :3007 ID[PSL] D ; INIT THE C BIT
U 10F6, 0000,003D,0180,0800,0000,125B :3008 =0 CALL J/SETCM ; SET THE CM BIT
U 10F7, 0810,0038,0180,0970,0000,10F8 :3009 D RC[OE] ; GET EXPECTED C BIT
U 10F8, 0000,003D,0180,0800,0000,1234 :3010 =0 CALL J/DISPAT ; LATCH THE DATA TYPE
U 10F9, 0000,003C,0180,0A00,0000,132E :3011 LAB R[0]
U 132E, 0000,003C,0180,0900,0000,132F :3012 LC RC[0]
U 132F, 0010,C014,0180,0800,0070,1330 :3013 SYNC10: ALD LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 1330, 0000,003C,3DF0,2C00,0000,1331 :3014 Q ID[PSL] ; GET THE C BIT
U 1331, 0019,2034,05C0,0800,0000,1332 :3015 Q-Q.AND.K[.1] ; MASK
U 1332, 001D,A000,0180,0800,0010,1333 :3016 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1333, 0000,013C,0180,0800,0000,10FA :3017 Z?
U 10FA, 0001,203D,0180,09E8,0000,1218 :3018 =0 ERROR2,RC[OD],Q ; C BIT FAILED
:3019
:3020 ; //////////////////////////////////////
:3021 ; +
:3022 ; CHECK THAT THE C BIT SETS
:3023 ; -
:3024
U 10FB, 0018,0038,4580,0A80,0000,10FC :3025 T14CS4: R[0] K[.8000] ; INIT THE AMX DATA
U 10FC, 0000,003D,0180,0800,0000,122F :3026 =0 SUBTEST
U 10FD, 0018,0038,0580,09F0,0000,10FE :3027 RC[OE] K[.1] ; INIT THE EXPECTED DATA
U 10FE, 0000,003D,0180,0800,0000,1215 :3028 =0 ERLOOP
U 10FF, 0F00,003C,0180,0800,0000,110A :3029 D 0
U 110A, 2000,003D,0180,0A08,4200,1235 :3030 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 110B, 0000,003C,3DF0,2C00,0000,1334 :3031 Q ID[PSL]
U 1334, 0019,2024,61C0,0800,0000,1335 :3032 Q-Q.ANDNOT.K[F]
U 1335, 081D,0030,0180,0800,0000,1336 :3033 D-D.OR.Q
U 1336, 0000,003C,3D80,3C00,0000,1110 :3034 ID[PSL] D ; INIT THE C BIT
U 1110, 0000,003D,0180,0800,0000,125B :3035 =0 CALL J/SETCM ; SET THE CM BIT
U 1111, 0810,0038,0180,0970,0000,1112 :3036 D RC[OE] ; GET EXPECTED DATA
U 1112, 0000,003D,0180,0800,0000,1234 :3037 =0 CALL J/DISPAT ; LATCH THE DATA TYPE
U 1113, 0000,003C,0180,0A00,0000,1337 :3038 LAB R[0]
U 1337, 0000,003C,0180,0900,0000,1338 :3039 LC RC[0]
U 1338, 0010,C014,0180,0800,0070,1339 :3040 SYNC11: ALD LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 1339, 0000,003C,3DF0,2C00,0000,133A :3041 Q ID[PSL] ; GET THE C BIT
U 133A, 0019,2034,05C0,0800,0000,133B :3042 Q-Q.AND.K[.1] ; MASK
U 133B, C01D,A000,0180,0800,0010,133C :3043 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 133C, 0000,013C,0180,0800,0000,1114 :3044 Z?
U 1114, 0001,203D,0180,09E8,0000,1218 :3045 =0 ERROR2,RC[OD],Q ; C BIT FAILED
:3046

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:3047 :////////////////////
:3048 :+
:3049 : NOW CHECK THE V BIT
:3050 : VSEL=1, PSL V_ALU SIGN*-AMX SIGN
:3051 :-
:3052 :
U 1115, 0018,0038,0980,09F0,0000,1116 :3053 T14CS5: RC[OE],K[.2] : SET EXPECTED V BIT
U 1116, 0000,003D,0180,0800,0000,122F :3054 =0 SUBTEST
U 1117, 0003,003C,0180,0A80,0000,133D :3055 RC[0] 0 : INIT AMX DATA
U 133D, 0018,0038,C180,0980,0000,1118 :3056 RC[0],K[.FFFF] : INIT BMX DATA
U 1118, 0000,003D,0180,0800,0000,1215 :3057 =0 ERLOOP
U 1119, 0F00,003C,0180,0800,0000,111A :3058 D 0
U 111A, 2000,003D,0180,0A08,4200,1235 :3059 =0 A[U R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 111B, 0000,003C,3DF0,2C00,0000,133E :3060 Q_ID[PSL]
U 133E, 0019,2024,61C0,0800,0000,133F :3061 Q-Q.ANDNOT.K[F]
U 133F, 081D,0030,0180,0800,0000,1340 :3062 D-D.OR.Q
U 1340, 0000,003C,3D80,3C00,0000,111C :3063 ID[PSL] D : INIT THE C BIT
U 111C, 0000,003D,0180,0800,0000,125B :3064 =0 CALL,J/SETCM : SET THE CM BIT
U 111D, 0810,0038,0180,0970,0000,111E :3065 D RC[OE] : GET EXPECTED DATA
U 111E, 0000,003D,0180,0800,0000,1234 :3066 =0 CALL,J/DISPAT : LATCH THE DATA TYPE
U 111F, 0000,003C,0180,0A00,0000,1341 :3067 LAB R[0]
U 1341, 0000,003C,0180,0900,0000,1342 :3068 LC RC[0]
U 1342, 0010,C014,0180,0800,0070,1343 :3069 SYNC12: ALD LA+LC,SET.CC(INST) : EXECUTE THE TEST
U 1343, 0000,003C,3DF0,2C00,0000,1344 :3070 Q_ID[PSL] : GET THE V BIT
U 1344, 0019,2034,09C0,0800,0000,1345 :3071 Q-Q.AND.K[.2] : MASK
U 1345, 001D,A000,0180,0800,0010,1346 :3072 A[U_Q-D,CLK.UBCC,BYTE : CHECK
U 1346, 0000,013C,0180,0800,0000,1120 :3073 Z?
U 1120, 0001,203D,0180,09E8,0000,1218 :3074 =0 ERROR2,RC[OD],Q : V BIT FAILED
:3075 :
:3076 :////////////////////
:3077 :+
:3078 : CHECK THAT THE V BIT CLEARS
:3079 :-
:3080 :
U 1121, 0018,0038,C180,0A80,0000,1122 :3081 T14CS6: RC[0],K[.FFFF] : INIT AMX DATA
U 1122, 0000,003D,0180,0800,0000,122F :3082 =0 SUBTEST
U 1123, 0003,003C,0180,0980,0000,1347 :3083 RC[0] 0 : INIT BMX DATA
U 1347, 0003,003C,0180,09F0,0000,1124 :3084 RC[OE] 0 : INIT EXPECTED V BIT
U 1124, 0000,003D,0180,0800,0000,1215 :3085 =0 ERLOOP
U 1125, 0818,0038,0980,0800,0000,1126 :3086 D K[.2]
U 1126, 2000,003D,0180,0A08,4200,1235 :3087 =0 A[U R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 1127, 0000,003C,3DF0,2C00,0000,1348 :3088 Q_ID[PSL]
U 1348, 0019,2024,61C0,0800,0000,1349 :3089 Q-Q.ANDNOT.K[F]
U 1349, 081D,0030,0180,0800,0000,134A :3090 D-D.OR.Q
U 134A, 0000,003C,3D80,3C00,0000,1128 :3091 ID[PSL] D : INIT THE C BIT
U 1128, 0000,003D,0180,0800,0000,125B :3092 =0 CALL,J/SETCM : SET THE CM BIT
U 1129, 0810,0038,0180,0970,0000,112A :3093 D RC[OE] : GET THE EXPECTED DATA
U 112A, 0000,003D,0180,0800,0000,1234 :3094 =0 CALL,J/DISPAT : LATCH THE DATA TYPE
U 112B, 0000,003C,0180,0A00,0000,134B :3095 LAB R[0]
U 134B, 0000,003C,0180,0900,0000,134C :3096 LC RC[0]
U 134C, 0010,C014,0180,0800,0070,134D :3097 SYNC13: ALD LA+LC,SET.CC(INST) : EXECUTE THE TEST
U 134D, 0000,003C,3DF0,2C00,0000,134E :3098 Q_ID[PSL] : GET THE V BIT
U 134E, 0019,2034,09C0,0800,0000,134F :3099 Q-Q.AND.K[.2] : MASK
U 134F, 001D,A000,0180,0800,0010,1350 :3100 A[U_Q-D,CLK.UBCC,BYTE : CHECK
U 1350, 0000,013C,0180,0800,0000,112C :3101 Z?
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U 112C. 0001,203D,0180,09E8,0000,1218 :3102 =0 ERROR2,RC[0D]_Q ; V BIT FAILED
:3103
:3104 :////////////////////
:3105 :+
:3106 : CHECK THAT THE V BIT CLEARS
:3107 :-
:3108
U 112D. 0003,003C,0180,0A80,0000,112E :3109 T14CS7: RC[0] 0 ; INIT AMX DATA
U 112E. 0000,003D,0180,0800,0000,122F :3110 =0 SUBTEST
U 112F. 0000,003C,0180,0800,0000,1130 :3111 NOP
U 1130. 0000,003D,0180,0800,0000,1215 :3112 =0 ERLOOP
U 1131. 0818,0038,0580,0800,0000,1132 :3113 D_K[.1]
U 1132. 2000,003D,0180,0A08,4200,1235 :3114 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1133. 0000,003C,3DF0,2C00,0000,1351 :3115 Q_ID[PSL]
U 1351. 0019,2024,61C0,0800,0000,1352 :3116 Q_Q.ANDNOT.K[F]
U 1352. 081D,0030,0180,0800,0000,1353 :3117 D_D.OR.Q
U 1353. 0000,003C,3D80,3C00,0000,1134 :3118 ID[PSL] D ; INIT THE C BIT
U 1134. 0000,003D,0180,0800,0000,125B :3119 =0 CALL J/SETCM ; SET THE CM BIT
U 1135. 0810,0038,0180,0970,0000,1136 :3120 D_RC[OE] ; GET EXPECTED VALUE
U 1136. 0000,003D,0180,0800,0000,1234 :3121 =0 CALL J/DISPAT ; LATCH THE DATA TYPE
U 1137. 0000,003C,0180,0A00,0000,1354 :3122 LAB RC[0]
U 1354. 0000,003C,0180,0900,0000,1355 :3123 LC RC[0]
U 1355. 0010,C014,0180,0800,0070,1356 :3124 SYNC14: ALD LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 1356. 0000,003C,3DF0,2C00,0000,1357 :3125 Q_ID[PSL] ; GET THE V BIT
U 1357. 0019,2034,09C0,0800,0000,1358 :3126 Q_Q.AND.K[.2] ; MASK
U 1358. 001D,A000,0180,0800,0010,1359 :3127 ACU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1359. 0000,013C,0180,0800,0000,1138 :3128 Z?
U 1138. 0001,203D,0180,09E8,0000,1218 :3129 =0 ERROR2,RC[0D]_Q ; V BIT FAILED
:3130
:3131 :////////////////////
:3132 :+
:3133 : VSEL=2, PSL V_PSL V(1)
:3134 :-
:3135
U 1139. 0003,003C,0180,0A80,0000,113A :3136 T14CS8: RC[0] 0 ; INIT AMX DATA
U 113A. 0000,003D,0180,0800,0000,122F :3137 =0 SUBTEST
U 113B. 0003,003C,0180,0980,0000,135A :3138 RC[0] 0 ; INIT BMX DATA
U 135A. 0000,003C,0180,0A08,0000,135B :3139 LAB RC[1]
U 135B. 0018,0014,0980,0A88,0000,135C :3140 RC[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
U 135C. 0018,0038,0980,09F0,0000,113C :3141 RC[OE]_K[.2] ; INIT EXPECTED V BIT
U 113C. 0000,003D,0180,0800,0000,1215 :3142 =0 ERLOOP
U 113D. 0818,0038,0980,0900,0000,113E :3143 D_K[.2]
U 113E. 2000,003D,0180,0A08,4200,1235 :3144 =0 ACU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 113F. 0000,003C,3DF0,2C00,0000,135D :3145 Q_ID[PSL]
U 135D. 0019,2024,61C0,0800,0000,135E :3146 Q_Q.ANDNOT.K[F]
U 135E. 081D,0030,0180,0800,0000,135F :3147 D_D.OR.Q
U 135F. 0000,003C,3D80,3C00,0000,1140 :3148 ID[PSL] D ; INIT THE C BIT
U 1140. 0000,003D,0180,0800,0000,125B :3149 =0 CALL J/SETCM ; SET THE CM BIT
U 1141. 0810,0038,0180,0970,0000,1142 :3150 D_RC[OE] ; GET THE EXPECTED VALUE
U 1142. 0000,003D,0180,0800,0000,1234 :3151 =0 CALL J/DISPAT ; LATCH THE DT
U 1143. 0000,003C,0180,0A00,0000,1360 :3152 LAB RC[0]
U 1360. 0000,003C,0180,0900,0000,1361 :3153 LC RC[0]
U 1361. 0010,C014,0180,0800,0070,1362 :3154 SYNC15: ALD LA+LC,SET.CC(INST) ; EXECUTE THE TEST
U 1362. 0000,003C,3DF0,2C00,0000,1363 :3155 Q_ID[PSL]
U 1363. 0019,2034,09C0,0800,0000,1364 :3156 Q_Q.AND.K[.2] ; MASK THE V BIT

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U 1364, 001D,A000,0180,0800,0010,1365 :3157      ALU_Q-D,CLK.UBCC,BYTE      : CHECK
U 1365, 0000,013C,0180,0800,0000,1144 :3158      Z?
U 1144, 0001,203D,0180,09E8,0000,1218 :3159      =0      ERROR2,RC[0D]_Q      : V BIT FAILED
:3160
:3161      ;////////////////////////////////////
:3162      ;+
:3163      ; CHECK THAT THE V BIT SETS
:3164      ;-
:3165
U 1145, 0018,0038,C180,0980,0000,1146 :3166      T14CS9: RC[0]_K[.FFFF]      : SET BMX DATA
U 1146, 0000,003D,0180,0800,0000,122F :3167      =0      SUBTEST
U 1147, 0000,003C,0180,0800,0000,1148 :3168      NOP
U 1148, 0000,003D,0180,0800,0000,1215 :3169      =0      ERLOOP
U 1149, 0818,0038,0980,0800,0000,114A :3170      D_K[.2]
U 114A, 2000,003D,0180,0A08,4200,1235 :3171      =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 114B, 0000,003C,3DF0,2C00,0000,1366 :3172      Q_ID[PSL]
U 1366, 0019,2024,61C0,0800,0000,1367 :3173      Q-Q.ANDNOT.K[F]
U 1367, 081D,0030,0180,0800,0000,1368 :3174      D-D.OR.Q
U 1368, 0000,003C,3D80,3C00,0000,114C :3175      ID[PSL] D      : INIT THE C BIT
U 114C, 0000,003D,0180,0800,0000,125B :3176      =0      CALL,J/SETCM      : SET THE CM BIT
U 114D, 0810,0038,0180,0970,0000,114E :3177      D_RC[OE]      : GET EXPECTED DATA
U 114E, 0000,003D,0180,0800,0000,1234 :3178      =0      CALL,J/DISPAT      : LATCH THE DATA TYPE
U 114F, 0000,003C,0180,0A00,0000,1369 :3179      LAB RC[0]
U 1369, 0000,003C,0180,0900,0000,136A :3180      LC RC[0]
U 136A, 0010,C014,0180,0800,0070,136B :3181      SYNC16: ALU_LA+LC,SET.CC(INST)      : EXECUTE THE TEST
U 136B, 0000,003C,3DF0,2C00,0000,136C :3182      Q_ID[PSL]
U 136C, 0019,2034,09C0,0800,0000,136D :3183      Q-Q.AND.K[.2]      : MASK
U 136D, 001D,A000,0180,0800,0010,136E :3184      ALU_Q-D,CLK.UBCC,BYTE      : CHECK
U 136E, 0000,013C,0180,0800,0000,1150 :3185      Z?
U 1150, 0001,203D,0180,09E8,0000,1218 :3186      =0      ERROR2,RC[0D]_Q      : V BIT FAILED
:3187
:3188      ;////////////////////////////////////
:3189      ;+
:3190      ; VSEL=4, PSL V_-ALU SIGN*PSL C(1)
:3191      ;-
:3192
U 1151, 0000,003C,0180,0A08,0000,1152 :3193      T14CSA: LAB RC[1]
U 1152, 0000,003D,0180,0800,0000,122F :3194      =0      SUBTEST
U 1153, 0018,0014,0980,0A88,0000,136F :3195      RC[1]_LA+K[.2]      : INCREMENT ADR OF IB DATA
U 136F, 0018,0038,0980,09F0,0000,1370 :3196      RC[OE]_K[.2]      : SET EXPECTED DATA
U 1370, 0003,003C,0180,0A80,0000,1154 :3197      RC[0] 0      : SET AMX DATA
U 1154, 0000,003D,0180,0800,0000,1215 :3198      =0      ERLOOP
U 1155, 0818,0038,0580,0800,0000,1156 :3199      D_K[.1]
U 1156, 2000,003D,0180,0A08,4200,1235 :3200      =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1157, 0000,003C,3DF0,2C00,0000,1371 :3201      Q_ID[PSL]
U 1371, 0019,2024,61C0,0800,0000,1372 :3202      Q-Q.ANDNOT.K[F]
U 1372, 081D,0030,0180,0800,0000,1373 :3203      D-D.OR.Q
U 1373, 0000,003C,3D80,3C00,0000,1158 :3204      ID[PSL] D      : INIT THE C BIT
U 1158, 0000,003D,0180,0800,0000,125B :3205      =0      CALL,J/SETCM      : SET THE CM BIT
U 1159, 0810,0038,0180,0970,0000,115A :3206      D_RC[OE]      : GET EXPECTED VALUE
U 115A, 0000,003D,0180,0800,0000,1234 :3207      =0      CALL,J/DISPAT      : LATCH THE DT
U 115B, 0000,C03C,0180,0A00,0070,1374 :3208      SYNC17: ALU_RC[0],SET.CC(INST)      : EXECUTE THE TEST
U 1374, 0000,003C,3DF0,2C00,0000,1375 :3209      Q_ID[PSL]
U 1375, 0019,2034,09C0,0800,0000,1376 :3210      Q-Q.AND.K[.2]      : MASK THE V BIT
U 1376, 001D,A000,0180,0800,0010,1377 :3211      ALU_Q-D,CLK.UBCC,BYTE      : CHECK
  
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U 1377, 0000,013C,0180,0800,0000,115C :3212
U 115C, 0001,203D,0180,09E8,0000,1218 :3213
:3214
:3215
:3216
:3217
:3218
:3219
U 115D, 0000,003C,0180,0A08,0000,115E :3220
U 115E, 0000,003D,0180,0800,0000,122F :3221
U 115F, 0018,0014,0980,0A88,0000,1378 :3222
U 1378, 0018,0038,0980,09F0,0000,1160 :3223
U 1160, 0000,003D,0180,0800,0000,1215 :3224
U 1161, 0F00,003C,0180,0800,0000,1162 :3225
U 1162, 2000,003D,0180,0AC8,4200,1235 :3226
U 1163, 0000,003C,3DF0,2C00,0000,1379 :3227
U 1379, 0019,2024,61C0,0800,0000,137A :3228
U 137A, 081D,0030,0180,0800,0000,137B :3229
U 137B, 0000,003C,3D80,3C00,0000,1164 :3230
U 1164, 0000,003D,0180,0800,0000,125B :3231
U 1165, 0000,C03C,0180,0800,0070,137C :3232
U 137C, 0810,0038,0180,0970,0000,137D :3233
U 137D, 0000,003C,3DF0,2C00,0000,137E :3234
U 137E, 0019,2034,09C0,0800,0000,137F :3235
U 137F, 001D,A000,0180,0800,0010,1380 :3236
U 1380, 0000,013C,0180,0800,0000,1166 :3237
U 1166, 0001,203D,0180,09E8,0000,1218 :3238
:3239
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:3245
U 1167, 0000,003C,0180,0A08,0000,1168 :3246
U 1168, 0000,003D,0180,0800,0000,122F :3247
U 1169, 0018,0014,0980,0A88,0000,1381 :3248
U 1381, 0003,003C,0180,09F0,0000,116A :3249
U 116A, 0000,003D,0180,0800,0000,1215 :3250
U 116B, 0818,0038,1180,0800,0000,116C :3251
U 116C, 2000,003D,0180,0A08,4200,1235 :3252
U 116D, 0000,003C,3DF0,2C00,0000,1382 :3253
U 1382, 0019,2024,61C0,0800,0000,1383 :3254
U 1383, 081D,0030,0180,0800,0000,1384 :3255
U 1384, 0000,003C,3D80,3C00,0000,116E :3256
U 116E, 0000,003D,0180,0800,0000,125B :3257
U 116F, 0000,C03C,0180,0800,0070,1385 :3258
U 1385, 0810,0038,0180,0970,0000,1386 :3259
U 1386, 0000,003C,3DF0,2C00,0000,1387 :3260
U 1387, 0019,2034,11C0,0800,0000,1388 :3261
U 1388, 001D,A000,0180,0800,0010,1389 :3262
U 1389, 0000,013C,0180,0800,0000,1170 :3263
U 1170, 0001,203D,0180,09E8,0000,1218 :3264
:3265
:3266

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:3267 :+
:3268 : NOW CHECK THE N BIT
:3269 : NSEL<2:0>=HHL, PSL N_-ALU SIGN*INV ALU SIGN (INV ALU SIGN IS HIGH)
:3270 :-
:3271
U 1171, 0018,0038,0180,09F0,0000,1172 :3272 T14CSD: RC[OE] K[.8] ; SET EXPECTED N BIT
U 1172, 0000,003D,0180,0800,0000,122F :3273 =0 SUBTEST
U 1173, 0003,003C,0180,0A80,0000,1174 :3274 RC[0] 0 ; SET ALU DATA
U 1174, 0000,003D,0180,0800,0000,1215 :3275 =0 ERLOOP
U 1175, 0818,0038,0180,0800,0000,1176 :3276 D K[.8]
U 1176, 2000,003D,0180,0A08,4200,1235 :3277 =0 ALU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1177, 0000,003C,3DF0,2C00,0000,138A :3278 Q_ID[PSL]
U 138A, 0019,2024,61C0,0800,0000,138B :3279 Q_Q.ANDNOT.K[F]
U 138B, 081D,0030,0180,0800,0000,138C :3280 D_D.OR.Q
U 138C, 0000,003C,3D80,3C00,0000,1178 :3281 ID[PSL] D ; INIT THE C BIT
U 1178, 0000,003D,0180,0800,0000,125B :3282 =0 CALL,J/SETCM ; SET THE CM BIT
U 1179, 0810,0038,0180,0970,0000,117A :3283 D RC[OE] ; GET EXPECTED N BIT
U 117A, 0000,003D,0180,0800,0000,1234 :3284 =0 CALL,J/DISPAT ; LATCH THE DATA TYPE
U 117B, 0000,C03C,0180,0A00,0070,138D :3285 SYNC1A: ALU RC[0],SET.CC(INST) ; EXECUTE THE TEST
U 138D, 0000,003C,3DF0,2C00,0000,138E :3286 Q_ID[PSL]
U 138E, 0019,2034,01C0,0800,0000,138F :3287 Q_Q.AND.K[.8] ; MASK THE N BIT
U 138F, 001D,A000,0180,0800,0010,1390 :3288 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1390, 0000,013C,0180,0800,0000,117C :3289 Z?
U 117C, 0001,203D,0180,09E8,0000,1218 :3290 =0 ERROR2,RC[OD]_Q ; N BIT FAILED
:3291
:3292 :////////////////////
:3293 :+
:3294 : CHECK THAT THE N BIT CLEARS
:3295 :-
:3296
U 117D, 0003,003C,0180,09F0,0000,117E :3297 T14CSE: RC[OE] 0 ; SET THE EXPECTED DATA
U 117E, 0000,003D,0180,0800,0000,122F :3298 =0 SUBTEST
U 117F, 0018,0038,4580,0A80,0000,1180 :3299 RC[0] K[.8000] ; SET THE ALU DATA
U 1180, 0000,003D,0180,0800,0000,1215 :3300 =0 ERLOOP
U 1181, 0F00,003C,0180,0800,0000,1182 :3301 D 0
U 1182, 2000,003D,0180,0A08,4200,1235 :3302 =0 ALU RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1183, 0000,003C,3DF0,2C00,0000,1391 :3303 Q_ID[PSL]
U 1391, 0019,2024,61C0,0800,0000,1392 :3304 Q_Q.ANDNOT.K[F]
U 1392, 081D,0030,0180,0800,0000,1393 :3305 D_D.OR.Q
U 1393, 0000,003C,3D80,3C00,0000,1184 :3306 ID[PSL] D ; INIT THE C BIT
U 1184, 0000,003D,0180,0800,0000,125B :3307 =0 CALL,J/SETCM ; SET THE CM BIT
U 1185, 0810,0038,0180,0970,0000,1186 :3308 D RC[OE] ; GET EXPECTED DATA
U 1186, 0000,003D,0180,0800,0000,1234 :3309 =0 CALL,J/DISPAT ; LATCH THE DATA TYPE
U 1187, 0000,C03C,0180,0A00,0070,1394 :3310 SYNC1B: ALU RC[0],SET.CC(INST) ; EXECUTE THE TEST
U 1394, 0000,003C,3DF0,2C00,0000,1395 :3311 Q_ID[PSL]
U 1395, 0019,2034,01C0,0800,0000,1396 :3312 Q_Q.AND.K[.8] ; MASK THE N BIT
U 1396, 001D,A000,0180,0800,0010,1397 :3313 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 1397, 0000,013C,0180,0800,0000,1188 :3314 Z?
U 1188, 0001,203D,0180,09E8,0000,1218 :3315 =0 ERROR2,RC[OD]_Q ; N BIT FAILED
:3316
:3317 :////////////////////
:3318 :+
:3319 : CSEL<2:0>=LLL, PSL C_1
:3320 :-
:3321

```



```

U 1189, 0000,003C,0180,0A08,0000,118A :3322 T14CSF: LAB R[1]
U 118A, 0000,003D,0180,0800,0000,122F :3323 =0 SUBTEST
U 118B, 0018,0014,0980,0A88,0000,1398 :3324 R[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
U 1398, 0018,0038,0580,09F0,0000,118C :3325 RC[OE]_K[.1] ; SET EXPECTED C BIT
U 118C, 0000,003D,0180,0800,0000,1215 :3326 =0 ERLOOP
U 118D, 0F00,003C,0180,0800,0000,118E :3327 D 0
U 118E, 2000,003D,0180,0A08,4200,1235 :3328 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 118F, 0000,003C,3DF0,2C00,0000,1399 :3329 Q_IB[PSL]
U 1399, 0019,2024,61C0,0800,0000,139A :3330 Q-Q.ANDNOT.K[F]
U 139A, 081D,003D,0180,0800,0000,139B :3331 D-D.OR.Q
U 139B, 0000,003C,3D80,3C00,0000,1190 :3332 ID[PSL] D ; INIT THE C BIT
U 1190, 0000,003D,0180,0800,0000,125B :3333 =0 CALL,J/SETCM ; SET THE CM BIT
U 1191, 0810,C038,0180,0970,0070,139C :3334 SYNC1C: D_RC[OE],SET.CC(INST) ; EXECUTE THE TEST
U 139C, 0000,003C,3DF0,2C00,0000,139D :3335 Q_IB[PSL]
U 139D, 0019,2034,05C0,0800,0000,139E :3336 Q-Q.AND.K[.1] ; MASK THE C BIT
U 139E, 001D,A000,0180,0800,0010,139F :3337 ACU_Q-D,CLK.UBCC,BYTE ; CHECK THE C BIT
U 139F, 0000,013C,0180,0800,0000,1192 :3338 Z?
U 1192, 0001,203D,0180,09E8,0000,1216 :3339 =0 ERROR1,RC[OD]_Q ; C BIT FAILED
U 1193, 0000,003C,0180,0800,0000,1194 :3340 NOP
:3341
:3342
:3343 ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3344 ;X 0
:3345 ; SUBTEST 1, AND 2
:3346 ;$ 7000
:3347 ; SUBTEST 3, 4, 5, 6, AND 7
:3348 ;$ 0C40
:3349 ; SUBTST 8 AND 9
:3350 ;$ 7400
:3351 ; SUBTEST A
:3352 ;$ 0C00
:3353 ; SUBTEST B
:3354 ;$ 7200
:3355 ; SUBTEST C, D, AND E
:3356 ;$ 2000
:3357 ; SUBTEST F
:3358 ;$ 0A40
:3359
:3360
:3361
    
```

```

3362 .PAGE 'TEST 14D CM BRANCH ENABLE 8 -- END DP1'
3363 .*****
3364 .++
3365 .TEST 14D CM BRANCH ENABLE 8 -- END DP1
3366 .
3367 .TEST DESCRIPTION
3368 .THIS TEST CHECKS THE BRANCH ENABLE 8 IN COMPATABILITY MODE. THIS
3369 .BRANCH IS DEFINED AS FOLLOWS:
3370 .
3371 .BIT 0 -- J CLASS + DM27
3372 .BIT 1 -- O CLASS
3373 .BIT 2 -- READ OR MODIFY
3374 .
3375 .MORE THAN ONE OPCODE IS USED TO TEST THESE THREE BITS BECAUSE
3376 .THE GATES THAT GENERATE THESE BITS HAVE NOT ALL BEEN TESTED.
3377 .THE TEST IS DONE BY LOADING THE INSTRUCTION BUFFER WITH THE SPECIFIED
3378 .OPCODE, AND JSR'ING TO A SUBROUTINE WITH THE BRANCH ENABLED.
3379 .THE SUBROUTINE PUTS A NUMBER IN THE Q REGISTER THAT INDICATES WHICH
3380 .BRANCH BITS WERE ASSERTED AND RETURNS TO THE TEST CODE. THE Q REGISTER
3381 .IS THEN CHECKED FOR THE CORRECT NUMBER.
3382 .
3383 .LOGIC DESCRIPTION
3384 .THIS TEST CHECKS THE LOGIC THAT GENERATES THE BRANCH SIGNALS AND
3385 .THE MULTIPLEXOR FOR THE BRANCH BITS ON THE IRC MODULE.
3386 .
3387 .ERROR DESCRIPTION
3388 .DATA: EXPECTED BRANCH BITS <2:0>
3389 .RECEIVED BRANCH BITS <2:0>
3390 .LOOP COUNT -- INDICATES WHICH OP CODE IS CURRENTLY IN THE IB
3391 .(SEE THE DATA TABLE, AT THE END OF THIS TEST, FOR THE OPCODES)
3392 .
3393 .SYNC POINT DESCRIPTION
3394 .ADDRESS SYNCID--BRANCH BITS ARE ASSERTED.
3395 .--
3396 .*****
3397 .=0
3398 T14D: NEWTST[.3]
3399 .R[1]_K[.10] ; INIT ADDRESS OF IB DATA
3400 .D_K[.34]
3401 .R[0]_D+K[.8]
3402 .
3403 .////////////////////
3404 .+
3405 .START THE TEST
3406 .-
3407 .
3408 .D_K[.14]
3409 .R[0C]_D+K[.2] ; SET THE LOOP COUNT
3410 T14DL1: VA R[0]
3411 .D[BYTE] CACHE.P ; FETCH EXP UPC BITS
3412 .R[0E]_D.AND.K[.FF] ; SAVE
3413 .=0 ERLOOP
3414 .NOP
3415 .=0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
3416 .NOP
    
```

U 1194, 0018,0039,0D80,09F8,0000,11FC
 U 1195, 0018,0038,6580,0A88,0000,13A0
 U 13A0, 0818,0038,2980,0800,0000,13A1
 U 13A1, 0019,0014,0180,0A80,0000,13A2

U 13A2, 0818,0038,2180,0800,0000,13A3
 U 13A3, 0019,0014,0980,09E0,0000,13A4
 U 13A4, 0000,003C,0180,0A00,0200,13A5
 U 13A5, 0000,803C,0180,C800,0000,13A6
 U 13A6, 0019,0034,4980,09F0,0000,1196
 U 1196, 0000,003D,0180,0800,0000,1215
 U 1197, 0000,003C,0180,0800,0000,1198
 U 1198, 2000,003D,0180,0A08,4200,1235
 U 1199, 0000,003C,0180,0800,0000,119A

```

U 119A, 0000,003D,0180,0800,0000,125B :3417 =0 CALL J/SETCM : SET THE CM BIT
U 119B, 0810,0038,0180,0970,0000,119C :3418 D_RC[OE] : GET EXPECTED UPC BITS
:3419 =0
U 119C, 0000,083D,0180,0800,0000,100C :3420 SYNC1D: CALL J/REIENT,END.DP1? : EXECUTE THE BRANCH
U 119D, 0019,2000,11C0,0800,0000,13A7 :3421 Q Q-K[.4] : ADJUST FOR UPC BIT 2
U 13A7, 001D,A000,0180,0800,0010,13A8 :3422 ACU_Q-D,CLK.UBCC,BYTE : CHECK
U 13A8, 0000,013C,0180,0800,0000,119E :3423 Z?
U 119E, 0001,203D,0180,09E8,0000,1218 :3424 =0 ERROR2,RC[OD]_Q : BEN 8 FAILED
U 119F, 0000,003C,0180,0A00,0000,13A9 :3425 LAB_R[0]
U 13A9, 0018,0014,0580,0A80,0000,13AA :3426 RC[0] LA+K[.1] : INCREMENT ADR OF EXPECTED DATA
U 13AA, 0000,003C,0180,0A08,0000,13AB :3427 LAB_R[1]
U 13AB, 0018,0014,0980,0A88,0000,13AC :3428 RC[1] LA+K[.2] : INCREMENT ADR OF IB DATA
U 13AC, 0810,0038,0180,0960,0000,13AD :3429 D_RC[OC]
U 13AD, 0019,8000,0580,09E0,0010,13AE :3430 RC[OC]_D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
U 13AE, 0000,013C,0180,0800,0000,11A0 :3431 Z?
U 11A0, 0000,003C,0180,0800,0000,13A4 :3432 =0 J/T14DL1 : CONTINUE
U 11A1, 0000,003C,0180,0800,0000,13AF :3433 NOP
:3434
:3435
:3436 : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3437 :% 10
:3438 : UPC BITS<2:0>=000, LOOP COUNT = 16 THRU 0D
:3439 :$ 0010,001F,0007,0037,0000,00C0,0140,0C00,2800,0A00
:3440 : OCTAL DATA OF THE ABOVE HEX DATA:
:3441 : 000020,000037,000007,000067,000000,000300,000500,006000,024000,005000
:3442 :
:3443 : UPC<2:0>=001, LOOP COUNT 0C THRU 0A
:3444 :$ 0017,0040,0800
:3445 : OCTAL DATA OF THE ABOVE HEX DATA:
:3446 : 000027,000100,004000
:3447 :
:3448 : UPC<2:0>=010, LOOP COUNT 09 THRU 03
:3449 :$ 0580,0980,0C80,0D00,0DC0,3000,5000
:3450 : OCTAL DATA OF THE ABOVE HEX DATA:
:3451 : 002600,004600,006200,006400,006700,030000,050000
:3452 :
:3453 : UPC BITS<2:0>=100, LOOP COUNT 02 AND 01
:3454 :$ 0D80,1000
:3455 : OCTAL EQUIVALENT OF THE ABOVE HEX DATA:
:3456 : 006600,010000
:3457 :
:3458 : THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:3459 :% 3C
:3460 :$ 0000,0000,0000,0000,0000,0101,0001,0001,0000,0000,0202
:3461
:3462

```

```

3463 .PAGE 'TEST 14E CM BRANCH ENABLE 9 -- PC MODES'
3464 .....
3465 .+
3466 .TEST 14E CM BRANCH ENABLE 9 -- PC MODES
3467
3468 .TEST DESCRIPTION
3469 .THIS TEST CHECKS THE BRANCH ENABLE 9 IN COMPATABILITY MODE. THE
3470 .BRANCH BITS ARE DEFINED AS FOLLOWS:
3471
3472 .BIT 0 - DST R = PC
3473 .BIT 1 - SM + DM 47 + 57
3474
3475 .THE TEST USES MORE THAN ONE OPCODE TO TEST THE LOGIC THAT GENERATES
3476 .THESE SIGNALS.
3477 .THE TEST IS PERFORMED BY LOADING THE OPCODE INTO THE INSTRUCTION
3478 .BUFFER AND JSR'ING TO A SUBROUTINE WITH THE BRANCH ENABLED.
3479 .THE SUBROUTINE PUTS A NUMBER IN THE Q REGISTER THAT CORRESPONDS
3480 .TO THE BRANCH BITS THAT ASSERTED AND RETURNS TO THE TEST.
3481 .THE Q REGISTER IS THEN CHECKED FOR THE CORRECT DATA.
3482
3483 .LOGIC DESCRIPTION
3484 .THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES THE
3485 .BRANCH BITS.
3486
3487 .ERROR DESCRIPTION
3488 .DATA: EXPECTED UPC BITS <1:0>
3489 .RECEIVED UPC BITS <1:0>
3490 .LOOP COUNT -- DESCRIBES WHICH DATA PATTERN IS CURRENTLY
3491 .IN THE INSTRUCTION BUFFER. (SEE THE DATA TABLE AT THE END
3492 .OF THIS TEST)
3493
3494 .SYNC POINT DESCRIPTION
3495 .ADDRESS - SYNC1E--BRANCH BITS ARE ACTIVE
3496 .--
3497 .....
3498 T14E: NEWTST[.3]
3499 .D_K[.50]
3500 .R[1]_D+K[.4] ; SET ADDRESS OF IB DATA 54(16)
3501 =0 .D_K[.6],CALL,J/DC4
3502 .R[0]_D
3503
3504 .////////////////////
3505 .+
3506 .START THE TEST
3507 .--
3508
3509 T14ES1: RC[OC]_K[.8] ; SET THE LOOP COUNT
3510 T14EL1: VA_R[0]
3511 .D[BYTE]_CACHE.P ; FETCH EXPECTED DATA
3512 .RC[OE]_D.AND.K[.FF] ; SAVE
3513 =0 .ERLOOP
3514 .NOP
3515 =0 .ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
3516 .NOP
3517 =0 .CALL,J/SETCM ; SET THE CM BIT
    
```

U 13AF, 0018,0039,0D80,09F8,0000,11FC
 U 13B0, 0818,0038,3580,0800,0000,13B1
 U 13B1, 0019,0014,1180,0A88,0000,11A2
 U 11A2, 0818,0039,D580,0800,0000,121E
 U 11A3, 0001,003C,0180,0A80,0000,13B2

U 13B2, 0018,0038,0180,09E0,0000,13B3
 U 13B3, 0000,003C,0180,0A00,0200,13B4
 U 13B4, 0000,803C,0180,C800,0000,13B5
 U 13B5, 0019,0034,4980,09F0,0000,11A4
 U 11A4, 0000,003D,0180,0800,0000,1215
 U 11A5, 0000,003C,0180,0800,0000,11A6
 U 11A6, 2000,003D,0180,0A08,4200,1235
 U 11A7, 0000,003C,0180,0800,0000,11A8
 U 11A8, 0000,003D,0180,0800,0000,125B


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U 11A9, 0810,0038,0180,0970,0000,11AA :3518      D_RC[0E]      ; GET EXPECTED DATA
:3519      =0
U 11AA, 0000,093D,0180,0800,0000,1008 :3520      SYNC1E: CALL,J/IBBRTABLE,PC.MODES? ; EXECUTE THE BRANCH
U 11AB, 001D,A000,0180,0800,0010,13B6 :3521      ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 13B6, 0000,013C,0180,0800,0000,11AC :3522      Z?
U 11AC, 0001,203D,0180,09E8,0000,1218 :3523      =0      ERROR2,RC[0D],Q      ; BEN 9 FAILED
U 11AD, 0000,003C,0180,0A00,0000,13B7 :3524      LAB_R[0]
U 13B7, 0018,0014,0580,0A80,0000,13B8 :3525      R[0],LA+K[.1] ; INCREMENT ADR OF EXP DATA
U 13B8, 0000,003C,0180,0A08,0000,13B9 :3526      LAB_R[1]
U 13B9, 0018,0014,0980,0A88,0000,13BA :3527      R[1],LA+K[.2] ; INCREMENT ADR OF IB DATA
U 13BA, 0810,0038,0180,0960,0000,13BB :3528      D_RC[0C]
U 13BB, 0019,8000,0580,09E0,0010,13BC :3529      R[0C],D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 13BC, 0000,013C,0180,0800,0000,11AE :3530      Z?
U 11AE, 0000,003C,0180,0800,0000,13B3 :3531      =0      J/T14EL1 ; CONTINUE
U 11AF, 0000,003C,0180,0800,0000,11B0 :3532      NOP
:3533
:3534      ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3535      ;Z 54
:3536      ; LOOP COUNT = 8 THRU 1
:3537      ;$ 0800,01C0,0DC0,0020,0007,0037,09C0,0027
:3538      ; OCTAL EQUIVALENT FOR THE ABOVE HEX DATA:
:3539      ; 004000,016000,006700,000040,000007,000067,004700,000047
:3540
:3541      ; FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:3542      ;Z 64
:3543      ;$ 0000,0000,0101,0302
:3544
:3545
    
```

CCCCCCCCCCCCCCCC

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:3546 .PAGE "TEST 14F CM BRANCH ENABLE A -- REI"
:3547 *****
:3548 ++
:3549 TEST 14F CM BRANCH ENABLE A -- REI
:3550
:3551 TEST DESCRIPTION
:3552 THIS TEST CHECKS THE BRANCH ENABLE A BITS IN COMPATABILITY MODE.
:3553 THE BITS ARE DEFINED AS FOLLOWS:
:3554
:3555 BIT 0 - SRC R = PC
:3556
:3557 THE BIT IS TESTED FIRST IN THE SET CONDITION AND THEN IN THE CLEAR
:3558 CONDITION.
:3559
:3560 LOGIC DESCRIPTION
:3561 THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES BIT
:3562 0 DURING BRANCH ENABLE A.
:3563
:3564 ERROR DESCRIPTION
:3565 DATA: EXPECTED BRANCH BITS <2:0>
:3566 RECEIVED BRANCH BITS <2:0>
:3567 LOOP COUNT -- INDICATES WHETHER THE BIT SHOULD BE ASSERTED
:3568 ( LOOP COUNT = 2) OR DEASSERTED (LOOP COUNT =1).
:3569
:3570 SYNC POINT DESCRIPTION
:3571 ADDRESS SYNC1F--BRANCH BITS ARE ACTIVE
:3572 --
:3573 *****
:3574 =0
:3575 T14F: NEWTST
:3576 RC[0F] K[.4] : 4 ARGUMENTS FOR TYPEOUT
:3577 =0 D_K[.6],CALL,J/DCC : GEN ADDRESS OF IB DATA
:3578 RC[1]_D : SAVE
:3579 =0 D_K[.7],CALL,J/DCO : GEN ADDRESS OF EXP DATA
:3580 RC[0]_D : SAVE
:3581
:3582 :////////////////////
:3583 :+
:3584 : START THE TEST
:3585 :-
:3586
:3587 T14FS1: RC[0C] K[.2] : SET THE LOOP COUNT
:3588 T14FL1: VA RC[0]
:3589 D[BYTE] CACHE.P : FETCH THE EXP DATA
:3590 RC[0E]_D.AND.K[.FF] : SAVE
:3591 =0 ERLOOP
:3592 NOP
:3593 =0 ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
:3594 NOP
:3595 =0 CALL,J/SETCM : SET THE CM BIT
:3596 D_RC[0E] : GET EXPECTED DATA
:3597 =0
:3598 SYNC1F: CALL,J/REIENT,BEN/REI : EXECUTE THE BRANCH
:3599 Q_Q-K[.4] : ADJUST FOR BIT 2
:3600 ACU_Q-D,CLK.URCC,BYTE : CHECK

```

U 11B0, 0000,003D,0180,0800,0000,11FC
U 11B1, 0018,0038,1180,09F8,0000,11B2
U 11B2, 0818,0039,D580,0800,0000,1226
U 11B3, 0001,003C,0180,0A88,0000,11B4
U 11B4, 0818,0039,5D80,0800,0000,121A
U 11B5, 0001,003C,0180,0A80,0000,13BD

U 13BD, 0018,0038,0980,09E0,0000,13BE
U 13BE, 0000,003C,0180,0A00,0200,13BF
U 13BF, 0000,803C,0180,C800,0000,13C0
U 13C0, 0019,0034,4980,09F0,0000,11B6
U 11B6, 0000,003D,0180,0800,0000,1215
U 11B7, 0000,003C,0180,0800,0000,11B8
U 11B8, 2000,003D,0180,0A08,4200,1235
U 11B9, 0000,003C,0180,0800,0000,11BA
U 11BA, 0000,003D,0180,0800,0000,125B
U 11BB, 0810,0038,0180,0970,0000,11BC

U 11BC, 0000,0A3D,0180,0800,0000,100C
U 11BD, 0019,2000,11C0,0800,0000,13C1
U 13C1, 001D,A000,0180,0800,0010,13C2

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U 13C2, 0000,013C,0180,0800,0000,11BE :3601
U 11BE, 0001,203D,0180,09E8,0000,1218 :3602
U 11BF, 0000,003C,0180,0A00,0000,13C3 :3603
U 13C3, 0018,0014,0580,0A80,0000,13C4 :3604
U 13C4, 0000,003C,0180,0A08,0000,13C5 :3605
U 13C5, 0018,0014,0980,0A88,0000,13C6 :3606
U 13C6, 0810,0038,0180,0960,0000,13C7 :3607
U 13C7, 0019,8000,0580,09E0,0010,13C8 :3608
U 13C8, 0000,013C,0180,0800,0000,11C0 :3609
U 11C0, 0000,003C,0180,0800,0000,13BE :3610
U 11C1, 0000,003C,0180,0800,0000,11C2 :3611
                                     :3612
                                     :3613
                                     :3614
                                     :3615
                                     :3616
                                     :3617
                                     :3618
                                     :3619
                                     :3620
                                     :3621
                                     :3622
                                     :3623
                                     :3624
                                     :3625
                                     :3626

                                     Z?
                                     ERROR2,RC[0D]_0
                                     LAB RC[0]
                                     RC[0] LA+K[.1]
                                     LAB RC[1]
                                     RC[1] LA+K[.2]
                                     D RC[0C]
                                     RC[0C]_D-K[.1],CLK.UBCC,BYTE
                                     Z?
                                     J/T14FL1
                                     NOP

                                     ; BEN A FAILED
                                     ; INCREMENT ADR OF EXP DATA
                                     ; INCREMENT ADR OF IB DATA
                                     ; CHECK LOOP COUNT
                                     ; CONTINUE

                                     : THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                     :Z 6C
                                     :$ 0000,01C0
                                     : OCTAL EQUIVALENT FOR THE ABOVE OPCODES:
                                     : 000000,000700

                                     : THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                     :Z 70
                                     :$ 0100

                                     : THE FOLLOWING LONG WORD IS RESERVED FOR THE CANCEL TESTS.
                                     :Z 80
                                     :$ 0000,0000

```

```
3627 PAGE 'TEST 150 VAX MODE BRANCH ENABLE 8 -- DATA TYPE'
3628 *****
3629 ++
3630 TEST 150 VAX MODE BRANCH ENABLE 8 -- DATA TYPE
3631
3632 TEST DESCRIPTION
3633 THIS TEST CHECKS THE FUNCTIONS THAT ASSERT THE BITS OF THE DATA
3634 TYPE BRANCH. SINCE SOME OF THESE FUNCTIONS, SUCH AS ASRC AND VSRC,
3635 ARE NOT ACTIVE AT DECISION POINT 0, CERTAIN OP CODES ARE ADVANCED
3636 TO DECISION POINT 1 OR 2 DEPENDING ON WHEN THE SIGNALS GO ACTIVE.
3637 THE BRANCH IS EXECUTED BY JSR'ING TO A TABLE THAT PUTS
3638 A NUMBER IN THE Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT
3639 ASSERTED. THE TABLE RETURNS TO THE TEST CODE WHERE THE Q REGISTER
3640 IS CHECKED FOR THE CORRECT DATA.
3641
3642 SUBTST1 - CHECK THOSE OP CODES THAT CAN BE EXECUTED AT DECISION
3643 POINT 1.
3644 SUBTST 2 - CHECK THOSE OPCODES THAT MUST BE EXECUTED AT DECISION
3645 POINT 2
3646 SUBTST 3 - CHECK THOSE OPCODES THAT MUST BE EXECUTED AT DECISION
3647 POINT 3.
3648
3649 LOGIC DESCRIPTION
3650 THIS TEST CHECKS THE BRANCH MULTIPLEXOR ON THE IRC MODULE AND THE
3651 USC MODULE.
3652
3653 ERROR DESCRIPTION
3654 DATA: EXPECTED BRANCH BITS <2:0>
3655 RECEIVED BRANCH BITS <2:0>
3656 LOOP COUNT - INDICATES WHICH OP CODE IS CURRENTLY BE USED
3657 TO GENERATE THE BRANCH CONDITIONS. ( SEE THE DATA TABLE
3658 AT THE END OF THIS TEST). SUBTST 1 ONLY.
3659
3660 SYNC POINT DESCRIPTION
3661 SUBTST 1 - SYNC20--BRANCH BITS SHOULD BE STABLE
3662 SUBTST 2 - SYNC21--BRANCH BITS SHOULD BE STABLE
3663 SUBTST 3 - SYNC22--BRANCH BITS SHOULD BE STABLE
3664 --
3665 *****
3666 =0
3667 T150: NEWTST[.3]
3668 RC[0C] K[.3] ; SET THE LOOP COUNT
3669 =0 D K[.1],CALL,J/DC6
3670 NOP
3671 =0 CALL,J/DC8
3672 R[1] D ; ADR OF IB DATA
3673 =0 D K[.1],CALL,J/DC7
3674 NOP
3675 =0 CALL,J/DC4
3676 R[0]_D
3677
3678 //////////////////////////////////////
3679 +
3680 CHECK THOSE FUNCTIONS THAT CAN BE TESTED AT DECISION POINT 0
3681 --
```

U 11C2, 0018,0039,0D80,09F8,0000,11FC
U 11C3, 0018,0038,0D80,09E0,0000,11C4
U 11C4, 0818,0039,0580,0800,0000,1220
U 11C5, 0000,003C,0180,0800,0000,11C6
U 11C6, 0000,003D,0180,0800,0000,1222
U 11C7, 0001,003C,0180,0A88,0000,11C8
U 11C8, 0818,0039,0580,0800,0000,1221
U 11C9, 0000,003C,0180,0800,0000,11CA
U 11CA, 0000,003D,0180,0800,0000,121E
U 11CB, 0001,003C,0180,0A80,0000,11CC


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:3682
:3683
U 11CC, 0000,003D,0180,0800,0000,122F :3684
U 11CD, 0000,003C,0180,0A00,0200,13C9 :3685
U 13C9, 0000,803C,0180,C800,0000,13CA :3686
U 13CA, 0019,0034,4980,09F0,0000,11CE :3687
U 11CE, 0000,003D,0180,0800,0000,1215 :3688
U 11CF, 0810,0038,0180,0970,0000,11D0 :3689
U 11D0, 2000,003D,0180,0A08,4200,1235 :3690
U 11D1, 0000,003C,0180,0800,0000,11D2 :3691
U 11D2, 0000,003D,0180,0800,0000,1234 :3692
U 11D3, 0000,003C,0180,0800,0000,11D4 :3693
:3694
U 11D4, 0000,083D,0180,0800,0000,1008 :3695
U 11D5, 001D,A000,0180,0800,0010,13CB :3696
U 13CB, 0000,013C,0180,0800,0000,11D6 :3697
U 11D6, 0001,203D,0180,09E8,0000,1218 :3698
:3699
:3700
:3701
:3702
:3703
U 11D7, 0000,003C,0180,0A00,0000,13CC :3704
U 13CC, 0018,0014,0580,0A80,0000,13CD :3705
U 13CD, 0000,003C,0180,0A08,0000,13CE :3706
U 13CE, 0018,0014,0980,0A88,0000,13CF :3707
U 13CF, 0810,0038,0180,0960,0000,13D0 :3708
U 13D0, 0019,8000,0580,09E0,0010,13D1 :3709
U 13D1, 0000,013C,0180,0800,0000,11D8 :3710
U 11D8, 0000,003C,0180,0800,0000,11CD :3711
:3712
:3713
:3714
:3715
:3716
:3717
U 11D9, 0000,003C,0180,0A00,0200,11DA :3718
U 11DA, 0000,003D,0180,0800,0000,122F :3719
U 11DB, 0000,803C,0180,C800,0000,13D2 :3720
U 13D2, 0019,0034,4980,09F0,0000,11DC :3721
U 11DC, 0000,003D,0180,0800,0000,1215 :3722
U 11DD, 0810,0038,0180,0970,0000,11DE :3723
U 11DE, 2000,003D,0180,0A08,4200,1235 :3724
U 11DF, 0000,003C,0180,0800,0000,11E0 :3725
U 11E0, 0000,003D,0180,0800,0000,1234 :3726
U 11E1, 0000,003C,0180,0800,0000,11E2 :3727
:3728
U 11E2, 0000,083D,0180,0800,0000,1008 :3729
U 11E3, 001D,A000,0180,0800,0010,13D3 :3730
U 13D3, 0000,013C,0180,0800,0000,11E4 :3731
U 11E4, 0001,203D,0180,09E8,0000,1218 :3732
:3733
:3734
:3735
:3736

=0
T150S1: SUBTEST
T150L1: VA R[0]
D[BYTE] CACHE.P ; GET EXP UPC BITS
RC[OE]_D.AND.K[.FF] ; SAVE
ERLOOP
D RC[OE]
=0
ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
NOP
=0
CALL,J/DISPAT ; LATCH THE BRANCH BITS
NOP
=0
SYNC20: CALL,J/IBRTABLE,DATA.TYPE? ; EXECUTE THE BRANCH
ALU_Q-D,CLK.UBCC,BYTE ; CHECK
Z?
=0
ERROR2,RC[OD]_Q

;+
; THE FOLLOWING CODE IS USED FOR LOOP CONTROL OF THIS SUBTEST
;-

LAB R[0]
R[0] LA+K[.1] ; INCREMENT ADR OF EXP DATA
LAB R[1]
R[1] LA+K[.2] ; INCREMENT ADR OF IB DATA
D RC[OC]
RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK LOOP COUNT
Z?
=0
J/T150L1 ; CONTINUE

;////////////////////////////////////
;+
; NOW CHECK CONDITION REQUIRING THE EXEC CT TO BE =1
;-

T150S2: VA R[0] ; LOAD ADR OF EXP UPC BITS
=0
SUBTEST
D[BYTE] CACHE.P ; GET EXP UPC BITS
RC[OE]_D.AND.K[.FF] ; SAVE
ERLOOP
D RC[OE]
=0
ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
IBC7CLR.1 ; ADVANCE EXECUTION POINT COUNTER
=0
CALL,J/DISPAT ; LATCH BRANCH BITS FROM B FORK
NOP
=0
SYNC21: CALL,J/IBRTABLE,DATA.TYPE? ; EXECUTE THE BRANCH
ALU_Q-D,CLK.UBCC,BYTE ; CHECK
Z?
=0
ERROR2,RC[OD]_Q

;////////////////////////////////////
;+

```

```

:3737 ; NOW CHECK BRANCH CONDITION REQUIRING THE EXC CT TO BE =2
:3738 :-
:3739
U 11E5, 0000,003C,0180,0A00,0000,13D4 :3740 T150S3: LAB R[0]
U 13D4, 0018,0014,0580,0A80,0000,11E6 :3741 R[0] LA+K[.1]
U 11E6, 0000,003D,0180,0800,0000,122F :3742 =0 SUBTEST
U 11E7, 0000,003C,0180,0A08,0000,13D5 :3743 LAB R[1]
U 13D5, 0018,0014,0980,0A88,0000,13D6 :3744 R[1] LA+K[.2]
U 13D6, 0000,003C,0180,0A00,0200,13D7 :3745 VA R[0] ; LOAD ADR OF EXP UPC BITS
U 13D7, 0000,803C,0180,C800,0000,13D8 :3746 D[BYTE] CACHE.P ; GET EXP UPC BITS
U 13D8, 0019,0034,4980,09F0,0000,11E8 :3747 RC[OE] D.AND.K[.FF] ; SAVE
U 11E8, 0000,003D,0180,0800,0000,1215 :3748 =0 ERLOOP
U 11E9, 0810,0038,0180,0970,0000,11EA :3749 D RC[OE]
U 11EA, 2000,003D,0180,0A08,4200,1235 :3750 =0 ACU R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11EB, D000,003C,0180,0800,0000,13D9 :3751 IBC7CLR.1
U 13D9, D000,003C,0180,0800,0000,11EC :3752 IBC/CLR.1 ; ADVANCE EXECUTION POINT COUNTER
U 11EC, 0000,003D,0180,0800,0000,1234 :3753 =0 CALL,J/DISPAT ; LATCH BRANCH BITS FROM C FORK
U 11ED, 0000,003C,0180,0800,0000,11EE :3754 NOP
:3755 =0
U 11EE, 0000,083D,0180,0800,0000,1008 :3756 SYNC22: CALL,J/IBBRTABLE,DATA.TYPE? ; EXECUTE THE BRANCH
U 11EF, 001D,A000,0180,0800,0010,13DA :3757 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
U 13DA, 0000,013C,0180,0800,0000,11F0 :3758 Z?
U 11F0, 0001,203D,0180,09E8,0000,1218 :3759 =0 ERROR2,RC[OD]_Q
U 11F1, 0000,003C,0180,0800,0000,11F2 :3760 NOP
:3761
:3762
:3763 ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:3764 ;% 168
:3765 ; SUBTST 1, LOOP COUNT 3 THRU 1
:3766 ;$ 6094
:3767 ;$ 6096
:3768 ;$ 600B
:3769 ; SUBTST 2
:3770 ;$ 6056
:3771 ; SUBTST 3
:3772 ;$ 60E0
:3773
:3774 ; THE FOLLOWING IS THE EXPECTED UPC BITS FOR THE ABOVE TEST:
:3775 ;% 174
:3776 ;$ 0400,0107,0002
:3777 =0
U 11F2, 0000,003D,0180,0800,0000,11FC :3778 T151: NEWTST
U 11F3, 0000,003C,0180,0800,0000,11F4 :3779 NOP
:3780 =0
U 11F4, 0000,003D,0180,0800,0000,11FC :3781 T152: NEWTST
U 11F5, 0000,003C,0180,0800,0000,13DB :3782 NOP
U 13DB, 0000,003D,0180,0800,0000,11FC :3783 ENDTST: NEWTST
:3784

```

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF Unused							
U 1000	1876=	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2102=	2103=	2104=	2105=	2106=	2107=	2108=	2109=
U 1010	2065=	2066=	2067=	2068=	2150=	2151=	2152=	2153=
U 1018	2165=	2166=	2167=	2168=	2169=	2170=	2171=	2172=
U 1020	2184=	2190=	2196=	2197=	2201=	2209=	2211=	2212=
U 1028	2217=	2218=	2219=	2220=	2221=	2222=	2234=	2240=
U 1030	2246=	2247=	2251=	2259=	2261=	2262=	2267=	2268=
U 1038	2269=	2270=	2271=	2272=	2284=	2290=	2296=	2297=
U 1040	2301=	2302=	2354=	2355=	2356=	2357=	2358=	2359=
U 1048	2361=	2362=	2364=	2365=	2373=	2374=	1920=	1846
U 1050	2375=	2376=	2377=	2378=	2388=	2397=	2399=	2400=
U 1058	2401=	2402=	1924=	1869	2404=	2405=	1928=	1870
U 1060	2406=	2407=	2408=	2409=	2414=	2420=	2429=	2437=
U 1068	2438=	2439=	2441=	2442=	2443=	2444=	2445=	2446=
U 1070	2451=	2457=	2466=	2474=	2475=	2476=	2478=	2479=
U 1078	2480=	2481=	2482=	2483=	2488=	2494=	2501=	2502=
U 1080	2575=	2582=	2583=	2584=	2585=	2586=	2589=	2590=
U 1088	2596=	2603=	2604=	2605=	2606=	2607=	2609=	2610=
U 1090	2616=	2617=	2646=	2653=	2654=	2655=	2656=	2657=
U 1098	2659=	2660=	2666=	2673=	2674=	2675=	2676=	2677=
U 10A0	2679=	2680=	2686=	2687=	2718=	2725=	2726=	2727=
U 10A8	2728=	2729=	2731=	2732=	2738=	2745=	2746=	2747=
U 10B0	2748=	2749=	2751=	2752=	2758=	2759=	2798=	2805=
U 10B8	2806=	2807=	2808=	2809=	2811=	2812=	2818=	2825=
U 10C0	2826=	2827=	2828=	2829=	2831=	2832=	2838=	2845=
U 10C8	2846=	2847=	2848=	2849=	2851=	2852=	2858=	2865=
U 10D0	2866=	2867=	2868=	2869=	2871=	2872=	2878=	2879=
U 10D8	2938=	2939=	2947=	2948=	2949=	2950=	2951=	2952=
U 10E0	2956=	2957=	2963=	2970=	2971=	2972=	2973=	2974=
U 10E8	2975=	2976=	2980=	2981=	2982=	2983=	2988=	2995=
U 10F0	2996=	2997=	3001=	3002=	3003=	3004=	3008=	3009=
U 10F8	3010=	3011=	3018=	3025=	3026=	3027=	3028=	3029=
U 1100	1831=	1832=	1833=	1834=	1835=	1836=	1837=	1838=
U 1108	1839=	1871	3030=	3031=	1840=	1841=	1842=	1843=
U 1110	3035=	3036=	3037=	3038=	3045=	3053=	3054=	3055=
U 1118	3057=	3058=	3059=	3060=	3064=	3065=	3066=	3067=
U 1120	3074=	3081=	3082=	3083=	3085=	3086=	3087=	3088=
U 1128	3092=	3093=	3094=	3095=	3102=	3109=	3110=	3111=
U 1130	3112=	3113=	3114=	3115=	3119=	3120=	3121=	3122=
U 1138	3129=	3136=	3137=	3138=	3142=	3143=	3144=	3145=
U 1140	3149=	3150=	3151=	3152=	3159=	3166=	3167=	3168=
U 1148	3169=	3170=	3171=	3172=	3176=	3177=	3178=	3179=
U 1150	3186=	3193=	3194=	3195=	3198=	3199=	3200=	3201=
U 1158	3205=	3206=	3207=	3208=	3213=	3220=	3221=	3222=
U 1160	3224=	3225=	3226=	3227=	3231=	3232=	3238=	3246=
U 1168	3247=	3248=	3250=	3251=	3252=	3253=	3257=	3258=
U 1170	3264=	3272=	3273=	3274=	3275=	3276=	3277=	3278=
U 1178	3282=	3283=	3284=	3285=	3290=	3297=	3298=	3299=
U 1180	3300=	3301=	3302=	3303=	3307=	3308=	3309=	3310=
U 1188	3315=	3322=	3323=	3324=	3326=	3327=	3328=	3329=
U 1190	3333=	3334=	3339=	3340=	3398=	3399=	3413=	3414=
U 1198	3415=	3416=	3417=	3418=	3420=	3421=	3424=	3425=

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	3432=	3433=	3501=	3502=	3513=	3514=	3515=	3516=
U 11A8	3517=	3518=	3520=	3521=	3523=	3524=	3531=	3532=
U 11B0	3575=	3576=	3577=	3578=	3579=	3580=	3591=	3592=
U 11B8	3593=	3594=	3595=	3596=	3598=	3599=	3602=	3603=
U 11C0	3610=	3611=	3667=	3668=	3669=	3670=	3671=	3672=
U 11C8	3673=	3674=	3675=	3676=	3684=	3685=	3688=	3689=
U 11D0	3690=	3691=	3692=	3693=	3695=	3696=	3698=	3704=
U 11D8	3711=	3718=	3719=	3720=	3722=	3723=	3724=	3725=
U 11E0	3726=	3727=	3729=	3730=	3732=	3740=	3742=	3743=
U 11E8	3748=	3749=	3750=	3751=	3753=	3754=	3756=	3757=
U 11F0	3759=	3760=	3778=	3779=	3781=	3782=	1872	1873
U 11F8	1874	1875	1882	1883	1897	1898	1899	1900
U 1200	2022:	1901	2023:	1902	2024:	1903	2025:	1904
U 1208	2026:	1905	1906	1907	1908	1909	1910	1911
U 1210	1912	1913	1914	1915	1916	1917	1918	1919
U 1218	1922	1923	1966	1967	1968	1969	1970	1971
U 1220	1972	1973	1974	1975	1976	1977	1978	1979
U 1228	1980	1981	1983	1984	1985	1986	1988	1998
U 1230	1999	2007	2008	2009	2019	2046	2047	2048
U 1238	2049	2050	2051	2052	2056	2057	2058	2059
U 1240	2060	2061	2062	2063	2064	2027:	2072	2028:
U 1248	2073	2074	2075	2076	2077	2078	2079	2029:
U 1250	2083	2030:	2084	2031:	2085	2086	2087	2032:
U 1258	2088	2089	2090	2093	2094	2095	2096	2097
U 1260	2110	2154	2155	2156	2164	2173	2174	2175
U 1268	2176	2177	2178	2179	2180	2181	2182	2183
U 1270	2191	2192	2193	2194	2195	2198	2199	2200
U 1278	2210	2213	2214	2215	2216	2223	2224	2225
U 1280	2226	2227	2228	2229	2230	2231	2232	2233
U 1288	2241	2242	2243	2244	2245	2248	2249	2033:
U 1290	2250	2260	2263	2264	2265	2266	2273	2274
U 1298	2275	2276	2277	2278	2279	2280	2281	2282
U 12A0	2283	2291	2292	2293	2294	2295	2298	2299
U 12A8	2300	2360	2036:	2363	2379	2380	2381	2382
U 12B0	2383	2384	2385	2386	2387	2398	2410	2411
U 12B8	2034:	2412	2413	2035:	2421	2422	2423	2424
U 12C0	2425	2426	2427	2428	2447	2448	2449	2450
U 12C8	2458	2459	2460	2461	2462	2463	2464	2465
U 12D0	2477	2484	2485	2486	2487	2495	2496	2497
U 12D8	2498	2499	2500	2587	2588	2591	2592	2593
U 12E0	2594	2595	2608	2611	2612	2613	2614	2615
U 12E8	2658	2661	2662	2663	2664	2665	2678	2681
U 12F0	2682	2683	2684	2685	2730	2733	2734	2735
U 12F8	2736	2737	2750	2753	2754	2755	2756	2757
U 1300	2810	2813	2814	2815	2816	2817	2830	2833
U 1308	2834	2835	2836	2837	2850	2853	2854	2855
U 1310	2856	2857	2870	2873	2874	2875	2876	2877
U 1318	2946	2953	2954	2955	2958	2959	2960	2961
U 1320	2962	2977	2978	2979	2984	2985	2986	2987
U 1328	2998	2999	3000	3005	3006	3007	3012	3013
U 1330	3014	3015	3016	3017	3032	3033	3034	3039
U 1338	3040	3041	3042	3043	3044	3056	3061	3062
U 1340	3063	3068	3069	3070	3071	3072	3073	3084

UUUUUUUU

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ESKAH39.MCR

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MICRO2

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J 6

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3089	3090	3091	3096	3097	3098	3099	3100
U 1350	3101	3116	3117	3118	3123	3124	3125	3126
U 1358	3127	3128	3139	3140	3141	3146	3147	3148
U 1360	3153	3154	3155	3156	3157	3158	3173	3174
U 1368	3175	3180	3181	3182	3183	3184	3185	3196
U 1370	3197	3202	3203	3204	3209	3210	3211	3212
U 1378	3223	3228	3229	3230	3233	3234	3235	3236
U 1380	3237	3249	3254	3255	3256	3259	3260	3261
U 1388	3262	3263	3279	3280	3281	3286	3287	3288
U 1390	3289	3304	3305	3306	3311	3312	3313	3314
U 1398	3325	3330	3331	3332	3335	3336	3337	3338
U 13A0	3400	3401	3408	3409	3410	3411	3412	3422
U 13A8	3423	3426	3427	3428	3429	3430	3431	3498
U 1380	3499	3500	3509	3510	3511	3512	3522	3525
U 1388	3526	3527	3528	3529	3530	3587	3588	3589
U 13C0	3590	3600	3601	3604	3605	3606	3607	3608
U 13C8	3609	3686	3687	3697	3705	3706	3707	3708
U 13D0	3709	3710	3721	3731	3741	3744	3745	3746
U 13D8	3747	3752	3758	3783				
U 13E0 - 13EF	Unused							
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

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ESKAH39.MCR

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Page 9

Words not
in bounds

ESK00DEF	0
ESK00MAC	0
ESKAHMAC	0
ESKAH39	1004

Used 1004
Remaining

Total microwords used in memory U: 1004
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

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ESKAH39.MCR MICRO2 1M(01) 16-DEC-82 12:30:35

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; The files used in this assembly are:
ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH39.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

3	Control ROM Field Definitions
548	Register Transfer Macro Definitions
1413	Non-transfer Functions
1485	Branch Enable Macro Definitions
1564	MICRO DIAGNOSTIC DEFINED MACROS
2085	TEST 153 VAX MODE BRANCH ENABLE 9 -- IR<2:1>
2159	TEST 154 VAX MODE BRANCH ENABLE B -- IB TEST
2201	TEST 155 MEMORY REFERENCE CANCELS
2401	TEST 156 'D MD' INHIBITED BY 'ABORT CYCLE'
2440	TEST 157 CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)
2847	TEST 158 PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE
2923	TEST 159 PREVIOUS MODE BITS SELECTED BY 'CHK CHG MODE'
3002	TEST 15A CURRENT MODE BITS AND CHECK CHANGE MODE
3126	TEST 15B CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK
3180	TEST 15C PSL 'IS' BIT LOAD DURING INTERRUPT ACKNOWLEDGE
3238	TEST 15D PSL TRAP PENDING (TP) BIT
3407	TEST 15E PSL BITS THAT ARE A FUNCTION OF 'LOAD FPD'
3522	TEST 15F VECTOR REGISTER DATA INTEGRITY BITS <31:16>
3660	TEST 160 SOFTWARE INTERRUPT REQUEST REGISTER

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ESKAH3A.MCR

Subroutines

MICRO2

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12:35:45

N

6

: 1

1804

: 1805

.NOLIST

LIST

SEQ 1104

Page

[illegible]

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:1806
:1807
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```

U 1100, 0000,003C,19C0,0A78,0084,7001

U 1101, 0000,003C,05C0,0A78,0084,7001

U 1102, 0000,003C,09C0,0A78,0084,7001

U 1103, 0000,003C,0DC0,0A78,0084,7001

U 1104, 0000,003C,11C0,0A78,0084,7001

U 1105, 0000,003C,D5C0,0A78,0084,7001

U 1106, 0000,003C,D9C0,0A78,0084,7001

U 1107, 0000,003C,5DC0,0A78,0084,7001

U 1108, 0000,003C,01C0,0A78,0084,7001

U 110C, 0000,003C,85C0,0A78,0084,7001

U 110D, 0000,003C,89C0,0A78,0084,7001

U 110E, 0000,003C,65C0,0A78,0084,7001

U 110F, 0000,003C,61C0,0A78,0084,7173

U 1001, 0001,2024,0180,0800,0010,104F

U 104F, 0000,013C,0180,0800,0000,1002

U 1002, 0001,2036,0180,0AF8,0000,0000

.REGION/1000,13FF

* FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF]. R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED. THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A 'TB MISS' MICRO TRAP IT WOULD SET BIT 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

```

1100: SC_K[ZERD],Q_R[OF],J/TRPH0      : SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0      : DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0      : X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0      : TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0      : TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0      : TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0      : RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0      : TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0      : CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0      : RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0      : TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0     : ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2      : CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC    : WAS TRAP EXPECTED?
      Z?                               : BRANCH IF NO
=0     ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 : CLEAR THE BIT AND RETURN

```

* THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED. IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
      TRAP CODE--INDICATES WHICH TRAP OCCURRED
      FAULT STATUS REGISTER
      SBI ERROR REGISTER
      TIMEOUT ADDRESS REGISTER
      MAINTENANCE REGISTER

```

U 1003.	0018.	0038.	1D80.	09E8.	0000.	1004	:1861
U 1004.	0000.	003D.	D980.	0800.	0084.	71A5	:1862
U 1005.	0000.	003C.	49F0.	2C00.	0000.	105B	:1863
U 105B.	0001.	203C.	4DF0.	2DB0.	0000.	105F	:1864
U 105F.	0001.	203C.	65F0.	2DB8.	0000.	1109	:1865
U 1109.	0001.	203C.	6DF0.	2DD8.	0000.	1154	:1866
U 1154.	0001.	203C.	75F0.	2DE0.	0000.	1170	:1867
U 1170.	0001.	203C.	79F0.	2DC8.	0000.	1171	:1868
U 1171.	0001.	203C.	69F0.	2DC0.	0000.	1172	:1869
U 1172.	0001.	203C.	81F0.	2DD0.	0000.	1000	:1870
U 1000.	0001.	203D.	0180.	09F0.	0000.	118A	:1871
							:1872
							:1873
							:1874
							:1875
							:1876
							:1877
							:1878
							:1879
							:1880
							:1881
U 1173.	0001.	2024.	0180.	0800.	0010.	1174	:1882
U 1174.	0000.	013C.	0180.	0800.	0000.	1006	:1883
U 1006.	0001.	2036.	0180.	0AF8.	0000.	0001	:1884
U 1007.	0000.	003C.	0180.	0800.	0000.	1003	:1885
							:1886
							:1887
							:1888
							:1889
							:1890
							:1891
							:1892
							:1893
							:1894
							:1895
							:1896
U 1175.	0000.	003C.	65F8.	0800.	0084.	7176	:1897
U 1176.	0818.	0038.	8D80.	0800.	0000.	1177	:1898
U 1177.	0D00.	003C.	0180.	0800.	0000.	1178	:1899
U 1178.	0000.	003C.	3D80.	3C00.	0000.	1179	:1900
U 1179.	0818.	0038.	0580.	0800.	0000.	117A	:1901
U 117A.	0D00.	003C.	0180.	0800.	0000.	117B	:1902
U 117B.	0F00.	003C.	3180.	3C00.	0000.	117C	:1903
U 117C.	0000.	003C.	5D80.	3C00.	0000.	117D	:1904
U 117D.	0000.	003C.	3980.	3C00.	0000.	117E	:1905
U 117E.	0000.	003C.	2980.	3C00.	0000.	117F	:1906
U 117F.	0000.	003C.	4980.	3C00.	0000.	1180	:1907
U 1180.	0000.	003C.	7180.	3C00.	0000.	1181	:1908
U 1181.	0818.	0038.	C180.	0800.	0000.	1182	:1909
U 1182.	0000.	003C.	6580.	3C00.	0000.	1183	:1910
U 1183.	0F00.	003C.	6D80.	3C00.	0000.	1184	:1911
U 1184.	0000.	003C.	6D80.	3C00.	0000.	1185	:1912
U 1185.	0000.	003C.	6580.	3C00.	0000.	1186	:1913
U 1186.	0003.	003C.	0180.	09F0.	0000.	1187	:1914
U 1187.	0003.	003C.	0180.	0AF8.	0000.	1188	:1915

```

:      CACHE PARITY REGISTER
:      TB ERROR REGISTER 1
:      TB ERROR REGISTER 0

```

```
TRPH1:  RC[0D] SC
        =0  SETRCF[.9]
          Q_ID[TBER0]
          RC[6] Q,Q_ID[TBER1]
          RC[7] Q,Q_ID[SBI.ERR]
          RC[0B] Q,Q_ID[FAULT]
          RC[0C] Q,Q_ID[MAINT]
          RC[9] Q,Q_ID[PARITY]
          RC[8] Q,Q_ID[TIME.ADDR]
          RC[0A] Q,Q_ID[STACK]
1000:   RC[0E] Q,ERROR1
```

; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.

```
TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
        Z?                             ; BRANCH IF NO
=0      ALU_Q[AND]MASK,R[OF]_ALU,RETURN ; RETURN
        J/TRPH1                       ; REPORT UNEXPECTED TRAP
```

```

; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

```

```

NEWST
ERLOOP
ERROR1
ERROR2

```

```
SCOPE: SC_K[10],Q_0
      D_R[1F]
      D-DAL.SC
      ID[PSL]_D
      D_K[1]
      D-DAL.SC
      ID[CES]_D,D_0
      ID[ACC.[S]_D
      ID[SIR]_D
      ID[CLK.[S]_D
      ID[TBERO]_D
      ID[COMP]_D
      D_K[FFFF]
      ID[SBI.ERR]_D
      ID[FAULT]_D,D_0
      ID[FAULT]_D
      ID[SBI.ERR]_D
      RC[OE]_0
      R[OF]_0
      : SETUP TO WRITE IPL OF 1F
      : ...
      : WRITE THE PSL
      : SETUP TO CLEAR THE CES REGISTER
      : CLEAR THE CES REGISTER
      : SHUT OFF THE FLOATING POINT
      : CLEAR THE SIR REGISTER
      : STOP INTERVAL TIMER
      : SHUT OFF THE TB
      : CLEAR SILO COMPARATOR
```

U 1188, 0003,003C,0180,09E8,0000,105E :1916
U 1189, 0818,0038,0980,0800,0000,105E :1917
U 118A, 0810,0038,0180,0978,0000,118B :1918
U 118B, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
U 118C, 0810,0038,0180,0978,0000,118D :1921
U 118D, 0819,0034,4D80,0800,0000,105A :1922
U 105A, 0819,0030,D580,0800,0000,105E :1923
U 105E, 0000,003C,1D80,3C00,0000,105E :1924
U 13F0, 0000,003C,0180,0800,0000,13F1 :1925
U 13F1, 0000,003C,0180,0800,0000,13F2 :1926
U 13F2, 0000,003C,0180,0800,0000,13F3 :1927
U 13F3, 0000,003C,0180,0800,0000,13F4 :1928
U 13F4, 0000,003C,0180,0800,0000,13F5 :1929
U 13F5, 0000,003C,0180,0800,0000,13F6 :1930
U 13F6, 0000,003C,0180,0800,0000,13F7 :1931
U 13F7, 0000,003C,0180,0800,0000,13F8 :1932
U 13F8, 0000,003C,0180,0800,0000,13F9 :1933
U 13F9, 0000,003C,0180,0800,0000,13FA :1934
U 13FA, 0000,003C,0180,0800,0000,13FB :1935
U 13FB, 0000,003C,0180,0800,0000,13FC :1936
U 13FC, 0000,003C,0180,0800,0000,13FD :1937
U 13FD, 0000,003C,0180,0800,0000,13FE :1938
U 13FE, 0000,003C,0180,0800,0000,13FF :1939
U 118E, 0018,0038,1980,0800,0000,119E :1940
U 118F, 0018,0038,1980,0800,0000,119F :1941
U 1190, 0018,0038,1980,0800,0000,11A0 :1942
U 1191, 0018,0038,1980,0800,0000,11A1 :1943
U 1192, 0018,0038,0980,0800,0000,119E :1944

RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_KC.2,J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.KC.FF00J
104E: D_D.OR.KC.4,J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.KC.FF00J
105A: D_D.OR.KC.6,J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE
+
THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
-
13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP
+
THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
FOR EXAMPLE: IF A HEX '55' IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

=0 D 0,CALL,J/DC5
NOP
=0 CALL,J/DC5
-
DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_KC.2,J/S00


```
U 1193, 0018,0038,0980,0800,0000,119F :1971 DC5: ALU_K[.2],J/S01
U 1194, 0018,0038,0980,0800,0000,11A0 :1972 DC6: ALU_K[.2],J/S10
U 1195, 0018,0038,0980,0800,0000,11A1 :1973 DC7: ALU_K[.2],J/S11
U 1196, 0018,0038,0580,0800,0000,119E :1974 DC8: ALU_K[.1],J/S00
U 1197, 0018,0038,0580,0800,0000,119F :1975 DC9: ALU_K[.1],J/S01
U 1198, 0018,0038,0580,0800,0000,11A0 :1976 DCA: ALU_K[.1],J/S10
U 1199, 0018,0038,0580,0800,0000,11A1 :1977 DCB: ALU_K[.1],J/S11
U 119A, 0018,0038,C180,0800,0000,119E :1978 DCC: ALU_K[.FFFF],J/S00
U 119B, 0018,0038,C180,0800,0000,119F :1979 DCD: ALU_K[.FFFF],J/S01
U 119C, 0018,0038,C180,0800,0000,11A0 :1980 DCE: ALU_K[.FFFF],J/S10
U 119D, 0018,0038,C180,0800,0000,11A1 :1981 DCF: ALU_K[.FFFF],J/S11
:1982
U 119E, 0118,0038,1B80,0800,0000,11A2 :1983 S00: ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 119F, 0118,0038,0B80,0800,0000,11A2 :1984 S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11A0, 0118,0038,0780,0800,0000,11A2 :1985 S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11A1, 0118,0038,C380,0800,0000,11A2 :1986 S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
:1987
U 11A2, 0100,003E,0380,0800,0000,0001 :1988 SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT
:1989
:1990
:1991
:1992 ;+
:1993 ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1994 ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1995 ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1996 ; TYPING IT.
:1997 ; -
:1998
U 11A3, 0810,0038,4D80,0978,0000,11A4 :1998 SUBTST: D_RC[0F],KMX/.FF00
U 11A4, 0019,4016,4D80,09F8,0000,0001 :1999 RC[0F],D+K[.FF00],WORD,RETURN1
:2000
:2001 ;+
:2002 ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:2003 ; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:2004 ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:2005 ; -
:2006
U 11A5, 0010,0038,01C0,0978,0000,11A6 :2007 SETRCF: Q_RC[0F]
U 11A6, 0019,2034,4DC0,0800,0000,11A7 :2008 Q-Q.AND.K[.FF00]
U 11A7, 0019,2032,1D80,09F8,0000,0001 :2009 RC[0F],Q.OR.SC,RETURN1
:2010
```

```

:2011
:2012
U 11A8, 0038,003B,41C0,0800,0000,1300 :2013
U 11A9, 0000,003F,0180,0800,0000,1300 :2014
:2015
U 1308, 0000,003E,0180,0800,0000,0001 :2016
U 133C, 0000,003E,0180,0800,0000,0001 :2017
U 134F, 0000,003E,0180,0800,0000,0001 :2018
U 1353, 0000,003E,0180,0800,0000,0001 :2019
U 137C, 0018,003A,0DC0,0800,0000,0001 :2020
U 137D, 0018,003A,05C0,0800,0000,0001 :2021
U 137E, 0018,003A,09C0,0800,0000,0001 :2022
U 138F, 0000,003E,01F8,0800,0000,0001 :2023
U 1390, 0000,003E,0180,0800,0000,0001 :2024
U 12C4, 0000,003E,0180,0800,0000,0001 :2025
:2026
:2027
:2028
:2029
:2030
:2031
U 1008, 0000,003E,01F8,0800,0000,0001 :2032
U 1009, 0018,003A,05C0,0800,0000,0001 :2033
U 100A, 0018,003A,09C0,0800,0000,0001 :2034
U 100B, 0018,003A,0DC0,0800,0000,0001 :2035
U 100C, 0018,003A,11C0,0800,0000,0001 :2036
U 100D, 0018,0038,11C0,0800,0000,11AA :2037
U 100E, 0018,003A,05C0,0800,0000,0001 :2038
U 100F, 0018,003A,0DC0,0800,0000,0001 :2039
U 11AA, 0019,2016,05C0,0800,0000,0001 :2040
:2041
:2042
:2043
:2044
:2045
:2046
:2047
:2048
:2049
U 11AB, 3000,003C,0180,6000,0000,11AC :2050
U 11AC, 0000,003C,0180,F800,0000,11AD :2051
U 11AD, 0000,003C,0180,F800,0000,11AE :2052
U 11AE, 0000,003C,0180,F800,0000,11AF :2053
U 11AF, 0000,003C,0180,F800,0000,11B0 :2054
U 11B0, 0000,003C,0180,F800,0000,11B1 :2055
U 11B1, 1000,003E,0180,F800,0000,0001 :2056
:2057
:2058
:2059
:2060
:2061
:2062
:2063
U 11B2, 0F00,003C,0180,0800,0000,11B3 :2064
U 11B3, 0000,003C,7580,3C00,0000,11B4 :2065

```

```

SYNCOO:
DISPAT: Q ALU.LEFT,ALU K[.80],SI/ZERO,SUB/SPEC,J/1300
DISPAT1: SUB/SPEC,J/1300

```

```

1308: RETURN1
133C: RETURN1
134F: RETURN1
1353: RETURN1
137C: Q_K[.3],RETURN1
137D: Q_K[.1],RETURN1
137E: Q_K[.2],RETURN1
138F: Q_0,RETURN1
1390: RETURN1
12C4: RETURN1

```

```

: THIS SUBROUTINE IS USED TO TEST THE IB BRANCH

```

```

=000
IBBRTABLE:
Q_0,RETURN1
Q_K[.1],RETURN1
Q_K[.2],RETURN1
Q_K[.3],RETURN1
REIENT: Q_K[.4],RETURN1
Q_K[.4],J/ADDONE
Q_K[.6],RETURN1
Q_K[.7],RETURN1
ADDONE: Q_Q+K[.1],RETURN1

```

```

: +
: THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
: CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
: IS COMPLETELY FULL OF DATA.
: BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
: -

```

```

IBWAIT: LOAD,IB,IBC/START
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ
MCT/ALLOW,IB,READ,IBC/STOP,RETURN1

```

```

: +
: THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE
: -

```

```

UNJAM: D_0
ID[MAINT]_D ; RELOAD THE MAT REG

```

```

D 0,MCT/SBI.HOLD ; ASSERT HOLD FOR 16 CYCLES
UNJAM0: A[U_D[XOR]K[F]],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
Z?,MCT/SBI.HOLD ; BRANCH IF YES
=0 D_D+K[1],MCT/SBI.HOLD,J/UNJAM0 ; CONTINUE HOLDING THE BUS

D 0,MCT/SBI.HOLD+UNJAM ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
UNJAM1: A[U_D[XOR]K[F]],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
Z?,MCT/SBI.HOLD+UNJAM ; BRANCH IF YES
=0 D_D+K[1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM

D 0,MCT/SBI.HOLD,INTRPT.ACK ; ASSERT HOLD FOR 16 CYCLES
UNJAM2: A[U_D[XOR]K[F]],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
Z?,MCT/SBI.HOLD ; BRANCH IF YES
=0 D_D+K[1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING

SC K[C]
D NOT.MASK,INTRPT.STROBE
ID[MAINT]_D,RETURN1 ; TURN OFF THE SBI

```

```

:2085 .PAGE "TEST 153 VAX MODE BRANCH ENABLE 9 -- IR<2:1>"
:2086 *****
:2087 ++
:2088 TEST 153 VAX MODE BRANCH ENABLE 9 -- IR<2:1>
:2089
:2090 TEST DESCRIPTION
:2091 THIS TEST CHECKS BRANCH BITS <2:0> FOR THE IR<2:1> BRANCH. THIS IS DONE
:2092 BY LOADING OPCODES OF 0, 2, AND 4, EXECUTING THE BRANCH, AND
:2093 CHECKING THAT THE CORRECT BRANCH BITS ASSERTED. THE BRANCH BITS
:2094 ARE RECEIVED BY JSR'ING TO A SUBROUTINE, WITH THE BRANCH ENABLED.
:2095 THE SUBROUTINE LOADS Q WITH A NUMBER THAT REPRESENTS THE CONDITION
:2096 OF BITS<2:0> AND RETURNS TO THE TEST CODE WHERE THE Q REGISTER IS
:2097 CHECKED FOR THE CORRECT NUMBER.
:2098
:2099 LOGIC DESCRIPTION
:2100 THIS TEST CHECKS THE BRANCH MULTIPLEXOR ON THE IRC AND USC
:2101 MODULES.
:2102
:2103 ERROR DESCRIPTION
:2104 DATA: EXPECTED BRANCH BITS <2:0>
:2105 RECEIVED BRANCH BITS <2:0>
:2106 LOOP COUNT - INDICATES WHICH OP CODE IS IN THE IB, I.E.
:2107 3=OPCODE 0, 2=OPCODE 2, 1=OPCODE 4
:2108
:2109 SYNC POINT DESCRIPTION
:2110 SYNCA3--BRANCH BITS ARE STABLE
:2111 --
:2112 *****
:2113 =0
:2114 T153: NEWTSTL.3]
:2115 RC[OC]_K[.3] ; SET THE LOOP COUNT
:2116 R[1]_K[.50] ; SET ADDRESS OF IB DATA
:2117 R[0]_K[.60] ; SET ADDRESS OF EXPECTED DATA
:2118
:2119 //////////////////////////////////////
:2120 +
:2121 START THE LOOP
:2122 -
:2123
:2124 T153L1: VA R[0]
:2125 D[BYTE]_CACHE.P ; FETCH EXPECTED DATA
:2126 RC[OE]_D.AND.K[.FF] ; SAVE
:2127 =0 ERLOOP
:2128 D RC[OE]
:2129 =0 A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2130 NOP
:2131 =0
:2132 SYNCA3: CALL,J/IBBRTABLE,IR2-1? ; EXECUTE THE BRANCH
:2133 ALU_Q-D,CLK.UBCC,BYTE ; CHECK
:2134 Z?
:2135 =0 ERROR2,RC[OD]_Q
:2136
:2137 +
:2138 THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
:2139 -

```

U 1016, 0018,0039,0D80,09F8,0000,1175
 U 1017, 0018,0038,0D80,09E0,0000,11BD
 U 11BD, 0018,0038,3580,0A88,0000,11BE
 U 11BE, 0018,0038,A580,0A80,0000,11BF

U 11BF, 0000,003C,0180,0A00,0200,11C0
 U 11C0, 0000,803C,0180,C800,0000,11C1
 U 11C1, 0019,0034,4980,09F0,0000,1018
 U 1018, 0000,003D,0180,0800,0000,1189
 U 1019, 0810,0038,0180,0970,0000,101A
 U 101A, 2000,003D,0180,0A08,4200,11AB
 U 101B, 0000,003C,0180,0800,0000,101C

U 101C, 0000,093D,0180,0800,0000,1008
 U 101D, 001D,A000,0180,0800,0010,11C2
 U 11C2, 0000,013C,0180,0800,0000,101E
 U 101E, 0001,203D,0180,09E8,0000,118C


```

:2140
U 101F, 0000,003C,0180,0A00,0000,11C3 :2141      LAB R[0]
U 11C3, 0018,0014,0580,0A80,0000,11C4 :2142      R[0] LA+K[.1]      ; INCREMENT ADR OF EXP DATA
U 11C4, 0000,003C,0180,0A08,0000,11C5 :2143      LAB R[1]
U 11C5, 0018,0014,0980,0A88,0000,11C6 :2144      R[1] LA+K[.2]      ; INCREMENT ADR OF IB DATA
U 11C6, 0810,0038,0180,0960,0000,11C7 :2145      D R[0C]
U 11C7, 0019,8000,0580,09E0,0010,11C8 :2146      R[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 11C8, 0000,013C,0180,0800,0000,1020 :2147      Z?
U 1020, 0000,003C,0180,0800,0000,11BF :2148      =0      J/T153L1      ; CONTINUE
U 1021, 0000,003C,0180,0800,0000,1022 :2149      NOP
:2150
:2151      ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
:2152      ;X 50
:2153      ;$ 0000,0002,0004
:2154
:2155      ; FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:2156      ;X 60
:2157      ;$ 0100,0002
:2158
```

```

:2159 .PAGE "TEST 154 VAX MODE BRANCH ENABLE B -- IB TEST"
:2160 *****
:2161 ++
:2162 TEST 154 VAX MODE BRANCH ENABLE B -- IB TEST
:2163
:2164 TEST DESCRIPTION
:2165 THIS TEST CHECKS THAT BRANCH BITS 0 AND 1 BOTH ASSERT WHEN THE
:2166 IB HAS VALID DATA WITH NO ERRORS DURING THE FETCH OF THE DATA.
:2167
:2168 LOGIC DESCRIPTION
:2169 THIS TEST CHECKS THE BRANCH MULTIPLEXOR AND THE LOGIC THAT FEEDS
:2170 THE MUX, ON THE IRC MODULE, FOR BRANCH ENABLE B.
:2171
:2172 ERROR DESCRIPTION
:2173 DATA: EXPECTED BRANCH BITS <1:0>
:2174 RECEIVED BRANCH BITS <1:0>
:2175
:2176 SYNC POINT DESCRIPTION
:2177 ADDRESS SYNCA4--BRANCH BITS ARE ACTIVE
:2178 --
:2179 *****
:2180 =0
:2181 T154: NEWTST[.2]
:2182 RC[OE]_K[.3] ; SET THE EXPECTED DATA
:2183 RC[1]_0 ; SET ADDRESS OF IB DATA
:2184
:2185 ///////////////////////////////////////////////////
:2186 +
:2187 START THE TEST
:2188 -
:2189
:2190 =0
:2191 T154S1: ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:2192 NOP
:2193
:2194 =0
:2195 SYNCA4: CALL,J/IBRTABLE,IB.TEST? ; EXECUTE THE BRANCH
:2196 D_RC[OE] ; GET EXPECTED DATA
:2197 A[U_Q-D,CLK.UBCC ; CHECK RESULT OF BRANCH
:2198 Z?
:2198 =0 ERROR2,RC[OD]_Q ; BRANCH BITS INCORRECT
:2199 NOP
:2200

```

U 1022. 0018.0039.0980.09F8.0000.1175
 U 1023. 0018.0038.0D80.09F0.0000.11C9
 U 11C9. 0003.003C.0180.0A88.0000.1024

U 1024. 2000.003D.0180.0A08.4200.11AB
 U 1025. 0000.003C.0180.0800.0000.1026

U 1026. 0000.0B3D.0180.0800.0000.1008
 U 1027. 0810.0038.0180.0970.0000.11CA
 U 11CA. 001D.2000.0180.0800.0010.11CB
 U 11CB. 0000.013C.0180.0800.0000.1028
 U 1028. 0001.203D.0180.09E8.0000.118C
 U 1029. 0000.003C.0180.0800.0000.102A

U 102A, 0018,0039,0980,09F8,0000,1175
U 102B, 0000,003C,0180,0800,0000,102C

```
:2201 .PAGE  'TEST 155      MEMORY REFERENCE CANCELS'
:2202 *****
:2203 ++
:2204
:2205 TEST 155      MEMORY REFERENCE CANCELS
:2206
:2207 TEST DESCRIPTION
:2208
:2209 THIS TEST CHECKS PART OF THE LOGIC THAT CANCELS MEMORY REFERENCES
:2210 DUE TO ERROR CONDITIONS. THE OTHER CONDITIONS THAT CAUSE CANCEL
:2211 ARE CHECKED LATER.
:2212
:2213 SUBTEST 1 - CHECK THAT A BAD IPA INHIBITS THE IB FROM GETTING
:2214 DATA FROM THE CACHE.
:2215
:2216 SUBTEST 2 - CHECK THAT A TB MISS ON A READ.V.NEWPC INHIBITS THE
:2217 IB FROM GETTING DATA.
:2218
:2219 SUBTEST 3 - CHECK THAT A TB PROTECTION FAILURE DURING A READ.V.NEWPC
:2220 INHIBITS THE IB FROM GETTING DATA.
:2221
:2222 SUBTEST 4 - CHECK THAT A TB PARITY ERROR DURING A READ.V.NEWPC
:2223 INHIBITS THE IB FROM GETTING DATA.
:2224
:2225 SUBTEST 5 - CHECK THAT AN ODD ADDRESS TRAP IN COMPATABILITY MODE
:2226 INHIBITS THE PARITY REGISTER FROM BEING CLOCKED.
:2227
:2228 LOGIC DESCRIPTION
:2229
:2230 THIS TEST CHECKS THE LOGIC ON THE TBM MODULE THAT GENERATES THE
:2231 CANCEL SIGNAL.
:2232
:2233 ERROR DESCRIPTION
:2234
:2235 SUBTESTS 1, 2, 3, AND 4
:2236 DATA: EXPECTED CALL3 CODE
:2237 RECEIVED CALL3 CODE
:2238
:2239 SUBTEST 5
:2240 DATA: EXPECTED DATA IN D REGISTER
:2241 RECEIVED DATA IN D REGISTER
:2242
:2243 NOTE: THE CALL3 CODE REPRESENTS THE ADDRESS THAT WAS SELECTED
:2244 DURING THE CALL3. 0=8F (GOOD DATA), 1=7D (IB ERROR), AND
:2245 2=7E (IB STALL BUT NO ERROR), 3=7C (TB MISS)
:2246
:2247
:2248 =0
:2249 T008: NEWTST[.2]
:2250 NOP
:2251
:2252 ///////////////////////////////////////////////////
:2253 +
:2254 CHECK THAT THE IB DOES NOT GET DATA IF THE IPA IS BAD.
:2255 -
```

```

:2256
:2257
U 102C. 0000,003D,0180,0800,0000,11A3 :2258
U 102D. 0018,0038,0980,09F0,0000,102E :2259
U 102E. 0000,003D,0180,0800,0000,1189 :2260
U 102F. 2003,003C,0180,0800,4200,11CC :2261
U 11CC. 3000,003C,0180,F800,0000,11CD :2262
U 11CD. 0000,003C,0180,F800,0000,11CE :2263
U 11CE. 0000,003C,0180,F800,0000,11CF :2264
U 11CF. 0000,003C,0180,F800,0000,11D0 :2265
U 11D0. 0000,003C,0180,F800,0000,11D1 :2266
U 11D1. 0000,003C,0180,F800,0000,11D2 :2267
U 11D2. 0000,003C,0180,F800,0000,11D3 :2268
U 11D3. 1818,0038,0980,0800,0000,1030 :2269
U 1030. 0000,003D,0180,0800,0000,11A9 :2270
U 1031. 001D,2000,0180,0800,0010,11D4 :2271
U 11D4. 0000,013C,0180,0800,0000,1032 :2272
U 1032. 0001,203D,0180,09E8,0000,118C :2273
U 1033. 0000,003C,0180,0800,0000,1034 :2274
:2275
:2276
:2277
:2278
:2279
:2280
:2281
:2282
U 1034. 0000,003D,0180,0800,0000,11A3 :2283
U 1035. 0018,0038,0D80,09F0,0000,11D5 :2284
U 11D5. 0000,003C,2180,0800,0084,71D6 :2285
U 11D6. 0803,001C,0180,0800,0000,11D7 :2286
U 11D7. 0819,0030,0580,0800,0000,11D8 :2287
U 11D8. 0000,003C,4980,3C00,0000,11D9 :2288
U 11D9. 0003,003C,0180,0800,0200,11DA :2289
U 11DA. 0818,0038,0D80,0800,0000,11DB :2290
U 11DB. 0819,0024,4180,0800,0000,11DC :2291
U 11DC. 0819,0030,0180,0800,0000,11DD :2292
U 11DD. 0800,003C,0180,0800,0000,11DE :2293
U 11DE. 0000,003C,4180,3C00,0000,1036 :2294
U 1036. 0000,003D,0180,0800,0000,1189 :2295
U 1037. 0000,003C,0180,0800,0000,1038 :2296
U 1038. 2003,003D,0180,0800,4200,11AB :2297
U 1039. 0810,0038,0180,0970,0000,103A :2298
U 103A. 0000,003D,0180,0800,0000,11A9 :2299
U 103B. 001D,2000,0180,0800,0010,11DF :2300
U 11DF. 0000,013C,0180,0800,0000,103C :2301
U 103C. 0001,203D,0180,09E8,0000,118C :2302
U 103D. 0000,003C,0180,0800,0000,103E :2303
:2304
:2305
:2306
:2307
:2308
:2309
:2310

```

```

=0
S1: SUBTEST
RC[OE],K[.2] ; SET THE EXPECTED CALL 3 CODE
ERLOOP
ALU_0(A),FLUSH.IB ; SHOULD SET THE BAD IPA SIGNAL
IBC7START,MCT/ALLOW.IB.READ ; START THE IB
MCT/ALLOW.IB.READ ; WAIT AND SEE IF IB GETS DATA
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
IBC/STOP,D K[.2] ; STOP THE IB
CALL,J/DISPAT1 ; EXECUTE THE CALL 3
ALU_Q-D,CLK.UBCC ; CHECK THE CALL3 CODE
Z?
ERROR2,RC[OD]_Q ; DID NOT GO TO ADDRESS 7E
NOP

```

////////////////////////////////////

:+ CHECK THAT THE IB DOES NOT GET ANY DATA IF THE TB IS NOT VALID

```

:2280
:2281
:2282
=0
S2: SUBTEST
RC[OE],K[.3] ; SET THE EXPECTED DATA
SC K[.T4] ; GENERATE DATA FOR TBERO
D_NOT.MASK
D_D.OR,K[.1]
ID[TBERO],D ; TURN THE TB ON
VA ALU,ALD_0(A) ; LOAD THE VA
D_K[.F0] ; GENERATE A PTE WITH THE VALID
D_D.ANDNOT,K[.80] ; BIT CLEAR
D_D.OR,K[.8] ; ...
D_D.SWAP
ID[TBUF],D ; LOAD THE TB
ERLOOP
NOP
ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; GO START THE IB
D RC[OE] ; GET THE EXPECTED CALL3 CODE
CALL,J/DISPAT1 ; GO EXECUTE THE CALL3
ALU_Q-D,CLK.UBCC ; OK?
Z?
ERROR2,RC[OD]_Q ; DID NOT GO TO ADDRESS 7E
NOP

```

////////////////////////////////////

:+ CHECK THAT THE IB DOES NOT GET ANY DATA IF THE PROTECTION IS BAD

:-


```

U 103E, 0000,003D,0180,0800,0000,11A3 :2311
U 103F, 0018,0038,0580,09F0,0000,11E0 :2312
U 11E0, 0000,003C,8D80,0800,0084,71E1 :2313
U 11E1, 0803,001C,0180,0800,0000,11E2 :2314
U 11E2, 0003,003C,0180,0800,0200,11E3 :2315
U 11E3, 0000,003C,4180,3C00,0000,1040 :2316
U 1040, 0000,003D,0180,0800,0000,1189 :2317
U 1041, 0000,003C,0180,0800,0000,1042 :2318
U 1042, 2003,003D,0180,0800,4200,11AB :2319
U 1043, 0810,0038,0180,0970,0000,1044 :2320
U 1044, 0000,003D,0180,0800,0000,11A9 :2321
U 1045, 001D,2000,0180,0800,0010,11E4 :2322
U 11E4, 0000,013C,0180,0800,0000,1046 :2323
U 1046, 0001,203D,0180,09E8,0000,118C :2324
U 1047, 0000,003C,0180,0800,0000,1048 :2325
                                     :2326
                                     :2327
                                     :2328
                                     :2329
                                     :2330
                                     :2331
                                     :2332
                                     :2333
                                     :2334
U 1046, 0000,003D,0180,0800,0000,11A3 :2335
U 1049, 0018,0038,0580,09F0,0000,11E5 :2336
U 11E5, 0818,0038,CD80,0800,0000,11E6 :2337
U 11E6, 0819,0030,0180,0800,0000,11E7 :2338
U 11E7, 0800,003C,0180,0800,0000,11E8 :2339
U 11E8, 0003,003C,0180,0800,0200,11E9 :2340
U 11E9, 0000,003C,4180,3C00,0000,11EA :2341
U 11EA, 0000,003C,49F0,2C00,0000,11EB :2342
U 11EB, 0819,2030,1180,0800,0000,11EC :2343
U 11EC, 0000,003C,4980,3C00,0000,104A :2344
U 104A, 0000,003D,0180,0800,0000,1189 :2345
U 104B, 0000,003C,0180,0800,0000,104C :2346
U 104C, 2003,003D,0180,0800,4200,11AB :2347
U 104D, 0810,0038,0180,0970,0000,1050 :2348
U 1050, 0000,003D,0180,0800,0000,11A9 :2349
U 1051, 001D,2000,0180,0800,0010,11ED :2350
U 11ED, 0000,013C,0180,0800,0000,1052 :2351
U 1052, 0001,203D,0180,09E8,0000,118C :2352
U 1053, 0F00,003C,0180,0800,0000,11EE :2353
U 11EE, 0000,003C,4980,3C00,0000,11EF :2354
U 11EF, 0000,003C,4D80,3C00,0000,11F0 :2355
U 11F0, 0000,003C,0180,6000,0000,1054 :2356
                                     :2357
                                     :2358
                                     :2359
                                     :2360
                                     :2361
                                     :2362
                                     :2363
                                     :2364
                                     :2365

=0
S3: SUBTEST
      RC[OE] K[.1] ; SET THE EXPECTED CALL3 CODE
      SC K[.TF] ; GENERATE DATA TO CAUSE BAD
      D NOT.MASK ; PROTECTION
      VA ALU,ALU_0(A) ; LOAD THE VA
      ID[TBUF]_D ; LOAD THE TB
      ERLOOP
      NOP
=0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; START THE IB
=0 D RC[OE] ; GET THE EXPECTED CALL3 CODE
=0 CALL,J/DISPAT1 ; GO EXECUTE THE CALL3
      ALU_Q-D,CLK.UBCC ; OK?
      Z?
=0 ERROR2,RC[OD]_Q ; DID NOT GO TO ADDRESS 7D
      NOP

////////////////////////////////////
:
: CHECK THAT THE IB DOES NOT GET ANY DATA WITH A TB PARITY ERROR
:
=0
S4: SUBTEST
      RC[OE] K[.1] ; SET THE EXPECTED CALL3 CODE
      D_K[F0] ; GENERATE DATA TO LOAD TB
      D-D.OR.K[.8]
      D-D.SWAP
      VA ALU,ALU_0(A)
      ID[TBUF]_D ; LOAD THE TB
      Q_ID[TBER0] ; FORCE PARITY ERROR IN GROUP 0
      D-Q.OR.K[.4] ; DATA 0
      ID[TBER0]_D
=0 ERLOOP
      NOP
=0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; START THE IB
=0 D RC[OE] ; GET EXPECTED DATA
=0 CALL,J/DISPAT1 ; GO EXECUTE THE CALL 3
      ALU_Q-D,CLK.UBCC ; OK?
      Z?
=0 ERROR2,RC[OD]_Q ; ADDRESS WAS NOT 7D
      D 0 ; CLEAR FORCE PARITY BITS
      ID[TBER0]_D
      ID[TBER1]_D ; CLEAR TRAP BIT
      LOAD.IB ; CLEAR IB ERROR BITS IN TBER1

////////////////////////////////////
:
: CHECK THAT THE PARITY REGISTER DOES NOT GET LOADED (BECAUSE OF
: CANCEL) DURING AN ODD ADDRESS TRAP AND CACHE PARITY ERROR.
:
=0

```

U 1054.	0000,003D,0180,0800,0000,11A3	:2366	SS:	SUBTEST	
U 1055.	0818,0038,4580,0800,0000,11F1	:2367		D_K[.8000]	: SET UP THE EXPECTED DATA
U 11F1.	0600,003C,0180,0800,0000,11F2	:2368		D_D.RIGHT	
U 11F2.	0001,003C,0180,09F0,0000,11F3	:2369		R[OE] D	: EQUALS 4000
U 11F3.	0818,0038,0580,0800,0000,11F4	:2370		D_K[.1]	: SETUP TO WRITE TEST DATA
U 11F4.	0018,0038,4180,0800,0200,11F5	:2371		VX ALU,ALU K[.80]	: LOAD THE VA
U 11F5.	0000,003C,0180,9800,0000,1056	:2372		MCT/VALIDATE	: WRITE THE TEST DATA
U 1056.	0000,003D,0180,0800,0000,1189	:2373	=0	ERLOOP	
U 1057.	0000,003C,8D80,1C00,0084,71F6	:2374		SC_K[.1F],CID/CONT	: SET CM MODE
		:2375			: AND CLEAR CONSOLE COMMAND MODE
U 11F6.	0803,001C,3DF0,2C00,0000,11F7	:2376		Q_ID[PSL],D_NOT.MASK	
U 11F7.	081D,0030,0180,0800,0000,11F8	:2377		D_D.OR.Q	
U 11F8.	0000,003C,3D80,3C00,0000,11F9	:2378		ID[PSL] D	: SET CM MODE
U 11F9.	0818,0038,5180,0800,0000,11FA	:2379		D_K[.1E]	: GENERATE DATA TO FORCE THE CACHE
U 11FA.	0000,003C,65F8,0800,0084,71FB	:2380		SC_K[.10],Q 0	: PARITY ERROR
U 11FB.	0D00,003C,75F0,2C00,0000,11FC	:2381		D_BAL.SC,Q_ID[MAINT]	
U 11FC.	081D,0030,0180,0800,0000,11FD	:2382		D_D.OR.Q	
U 11FD.	0000,003C,7580,3C00,0000,11FE	:2383		ID[MAINT] D	: LOAD THE MAINT REG
U 11FE.	0803,001C,0180,0800,0084,71FF	:2384		D_NOT.MASK,SC_K[.8]	: SET THE TRAP FLAG
U 11FF.	0001,001C,0180,0AF8,0000,1200	:2385		R[OF] D_ORNOT.MASK	
U 1200.	0818,0038,4580,0800,0000,1201	:2386		D_K[.8000]	: CLEAR THE PARITY REGISTER
U 1201.	0000,003C,7980,3C00,0000,1202	:2387		ID[PARITY]_D	: ...
U 1202.	0818,0038,4180,0800,0000,1203	:2388		D_K[.80]	
U 1203.	0019,0014,0580,0800,0200,1204	:2389		VX ALU,ALU D+K[.1]	: LOAD THE VA
U 1204.	0000,403C,0180,4000,0C00,1205	:2390		MCT/READ.V.RCHK,MSC/CHK.ODD.ADDR,WORD	
U 1205.	0818,0038,4580,0800,0000,1206	:2391		D_K[.8000]	
U 1206.	0200,003C,0180,0800,0000,1207	:2392		D_D.RIGHT2	: SETUP TO CLEAR FORCE PARITY
U 1207.	0600,003C,0180,0800,0000,1208	:2393		D_D.RIGHT	: D CONTAINS 1000(X)
U 1208.	0000,003C,7580,3C00,0000,1209	:2394		ID[MAINT] D	: LOAD THE MAINT REG
U 1209.	0810,0038,79F0,2D70,0000,120A	:2395		Q_ID[PARITY],D_R[OE]	: CHECK THAT PARITY REGISTER DID NOT
U 120A.	001D,2000,0180,0800,0010,120B	:2396		ALU_Q-D,CLK.UBCC	: GET LOADED.
U 120B.	0000,013C,0180,0800,0000,1058	:2397		Z?	
U 1058.	0001,203D,0180,09E8,0000,118C	:2398	=0	ERROR2,R[OD]_Q	: ODD ADDRESS DID NOT CAUSE CANCEL
U 1059.	0000,003C,0180,0800,0000,105C	:2399		NOP	
		:2400			

```

:2401 .PAGE 'TEST 156 'D_MD' INHIBITED BY 'ABORT CYCLE''
:2402 .....
:2403 ..
:2404 .
:2405 .TEST 156 'D_MD' INHIBITED BY 'ABORT CYCLE'
:2406 .
:2407 .TEST DESCRIPTION
:2408 .
:2409 .THIS TEST CHECKS THAT THE D REGISTER DOES NOT GET LOADED WITH
:2410 .THE DATA ON THE MD BUS DURING A READ IF 'ABORT CYCLE' IS ALSO
:2411 .ASCERTED. ABORT CYCLE IS ASCERTED BY DOING THE READ ON THE
:2412 .ECO'D ADDRESS.
:2413 .
:2414 .LOGIC DESCRIPTION
:2415 .
:2416 .THIS TEST CHECKS THE GATE, ON THE SBL MODULE, THAT INHIBITS THE SIGNAL
:2417 .'MD TO D' IF THE SIGNAL 'ABORT CYCLE' IS ASCERTED.
:2418 .
:2419 .ERROR DESCRIPTION
:2420 .
:2421 .DATA: EXPECTED CONTENTS OF THE D REGISTER
:2422 .RECEIVED CONTENTS OF THE D REGISTER
:2423 .
:2424 .....
:2425 .
:2426 =0
:2427 T156: NEWTST[.2]
:2428 RC[OE] 0 ; SET THE EXPECTED DATA
:2429 D_K[FFFF] ; WRITE DATA PATTERN IN 'D
:2430 VA_ALU,ALU_K[.80] ; THE CACHE
:2431 MCT/VALIDATE ; ...
:2432 =0 ERLOOP
:2433 VA_ALU,ALU_K[.80],D_0 ; LOAD THE ADDRESS
:2434 12AA: D[CONG] CACHE.P ; THIS ADDRESS IS ECO'D TO '1155'
:2435 1155: ALU_D,C[K.UBCC] ; CHECK THAT THE READ WAS ABORTED
:2436 Z?
:2437 =0 ERROR2,RC[OD],D ; D REGISTER WAS LOADED
:2438 NOP
:2439

```

```

U 105C, 0018,0039,0980,09F8,0000,1175
U 105D, 0003,003C,0180,09F0,0000,120C
U 120C, 0818,0038,C180,0800,0000,120D
U 120D, 0018,0038,4180,0800,0200,120E
U 120E, 0000,003C,0180,9800,0000,1060
U 1060, 0000,003D,0180,0800,0000,1189
U 1061, 0F18,0038,4180,0800,0200,12AA
U 12AA, 0000,003C,0180,C800,0000,1155
U 1155, 0001,003C,0180,0800,0010,120F
U 120F, 0000,013C,0180,0800,0000,1062
U 1062, 0001,003D,0180,09E8,0000,118C
U 1063, 0000,003C,0180,0800,0000,1064

```

```

:2440 .PAGE 'TEST 157 CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)'
:2441 *****
:2442 ++
:2443 .TEST 157 CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)
:2444
:2445 .TEST DESCRIPTION
:2446 THIS TEST CHECKS THE THREE BITS IN THE CES REGISTER THAT REPRESENT
:2447 THE ARITHMETIC TRAP CODES. SINCE TRAP CODE 0 IS A FUNCTION OF THE V DATA
:2448 SIGNALS, THE INSTRUCTION BUFFER MUST BE LOADED WITH SPECIFIC OP CODES TO
:2449 GENERATE THE REQUIRED CONDITIONS OF THE V DATA SIGNALS.
:2450
:2451 SUBTST 1 - CHECK THAT THE BITS SET AND CLEAR CORRECTLY WHEN WRITTEN
:2452 FROM THE ID BUS. ONLY 5 OF THE 8 POSSIBLE BIT PATTERNS
:2453 ARE TESTED IN THIS SUBTEST. THESE 5 PATTERNS SET OR CLEAR
:2454 THE TRAP CODES INDEPENDENTLY OF OTHER SIGNALS EXCEPT FOR THE
:2455 PSL IV BIT, WHICH IS SET FOR THIS SUBTEST.
:2456 SUBTST 2 - CHECK THAT THE BITS SET WHEN ALL ONE'S ARE WRITTEN TO THEM.
:2457 SUBTST 3 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN THE CONDITION
:2458 CODE LOAD IS NOT = 7.
:2459 SUBTST 4 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN THE PSL IV
:2460 BIT IS CLEAR.
:2461 SUBTST 5 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN "ID TO TRAP
:2462 CODE" IS TRUE.
:2463 SUBTST 6 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN GATES E50.8
:2464 AND E51.8 ARE NOT ASSERTED.
:2465 SUBTST 7 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN "EN IV TRAP"
:2466 IS NOT ASSERTED.
:2467 SUBTST 8 - CHECK THAT TRAP CODE 0 SETS WHEN GATE E50.8 IS ASSERTED.
:2468 SUBTST 9 - CHECK THAT TRAP CODE 0 SETS WHEN GATE E51.8 IS ASSERTED.
:2469 SUBTST A - CHECK THAT TRAP CODE 0 SETS WHEN GATE E50.8 IS ASSERTED.
:2470 SUBTST B - CHECK THAT "ID TO TRAP CODE" IS FALSE WHEN THE PSL IV
:2471 IS CLEAR AND ID BUS <6:4> IS = 1
:2472 SUBTST C - CHECK THAT "ID TO TRAP CODE" IS FALSE WHEN THE PSL DV
:2473 BIT IS CLEAR AND ID BUS <6:4> IS = 6
:2474 SUBTST D - CHECK THAT "ID TO TRAP CODE" IS TRUE WHEN THE PSL FU
:2475 BIT IS SET AND ID BUS <6:4> IS = 5
:2476
:2477 .LOGIC DESCRIPTION
:2478 THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT CONTROLS THE
:2479 SETTING AND CLEARING OF THE ARITHMETIC TRAP CODES.
:2480
:2481 .ERROR DESCRIPTION
:2482 DATA: EXPECTED ARITHMETIC TRAP CODE
:2483 RECEIVED ARITHMETIC TRAP CODE
:2484 LOOP COUNT FOR SUBTEST 1 ONLY -- INDICATES WHICH VALUE
:2485 OF ID BUS BITS<6:4> IS BEING USED, I.E.
:2486 4= 1, 3= 2, 2= 3, AND 1= 4
:2487
:2488 .SYNC POINT DESCRIPTION
:2489 SUBTST 1 - SYNC06--LOAD THE TRAP CODES
:2490 SYNC07--READ THE TRAP CODES
:2491 SYNC08--CLEAR THE TRAP CODES WITH ID BUS BITS<6:4>=0
:2492 SUBTST 2 - SYNC09--SET THE TRAP CODES
:2493 SYNC0A--READ THE TRAP CODES
:2494 SUBTST 3 - SYNC0B--CLOCK TRAP CODE 0

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:2495 : SUBTST 4 - SYNCOC--CLOCK TRAP CODE 0
:2496 : SUBTST 5 - SYNCOD--CLOCK TRAP CODE 0
:2497 : SUBTST 6 - SYNCOE--CLOCK TRAP CODE 0
:2498 : SUBTST 7 - SYNCOF--CLOCK TRAP CODE 0
:2499 : SUBTST 8 - SYNC10--SET TRAP CODE 0
:2500 : SUBTST 9 - SYNC11--SET TRAP CODE 0
:2501 : SUBTST A - SYNC12--SET TRAP CODE 0
:2502 : SUBTST B - SYNC13--"ID TO TRAP CODE" SHOULD BE FALSE
:2503 : SUBTST C - SYNC14--"ID TO TRAP CODE" SHOULD BE FALSE
:2504 : SUBTST D - SYNC15--"ID TO TRAP CODE" SHOULD BE TRUE
:2505 :--
:2506 :*****
:2507 :
U 1064, 0000,003D,0180,0800,0000,1175 :2508 T157: NEWTST
U 1065, 0018,0038,0D80,09F8,0000,1066 :2509 RC[OF],K[.3] : THREE ARGS FOR TYPEOUT
U 1066, 0818,0039,5D80,0800,0000,118E :2510 =0 D,K[.7],CALL,J/DCO : GENERATE MASK FOR TRAP CODE
U 1067, 0001,003C,0180,0A80,0000,1068 :2511 R[0],D : SAVE
:2512 :
:2513 :////////////////////
:2514 :
:2515 :+
:2516 : FIRST CHECK THOSE FUNCTIONS THAT ARE ONLY A FUNCTION OF THE ID BUS DATA
:2517 : ID BUS<6:4>=LLH,LHL,LHH,HLL, AND LLL
:2518 :--
:2519 :
:2520 :
U 1068, 0000,003D,0180,0800,0000,11A3 :2521 T157S1: SUBTEST
U 1069, 0018,0038,6580,09F0,0000,1210 :2522 RC[OE],K[.10] : INIT THE EXPECTED DATA
U 1210, 0018,0038,1180,09E0,0000,1211 :2523 RC[OC],K[.4] : SET THE LOOP COUNT
U 1211, 0818,0038,7580,0800,0000,1212 :2524 D,K[.20] : GET DATA TO INIT THE PSL
U 1212, 0000,003C,3D80,3C00,0000,106A :2525 ID[PSL],D : SET THE IV BIT IN THE PSL
:2526 :
:2527 :
U 106A, 0000,003D,0180,0800,0000,1189 :2527 T157L1: ERLOOP
U 106B, 0810,0038,0180,0970,0000,1213 :2528 D,RC[OE] : GET THE EXPECTED DATA
U 1213, 0000,003C,3180,3C00,0000,1214 :2529 SYNC06: ID[CES],D : EXECUTE THE LOAD OF THE TRAP CODES
U 1214, 0000,003C,31F0,2C00,0000,1215 :2530 SYNC07: Q,ID[CES] : READ THEM BACK
U 1215, 001C,0034,01C0,0A00,0000,1216 :2531 Q-Q.AND,R[0] : MASK
U 1216, 001D,2000,0180,0800,0010,1217 :2532 A[U,Q-D,CLK,UBCC : CHECK
U 1217, 0000,013C,0180,0800,0000,106C :2533 Z?
U 106C, 0001,203D,0180,09E8,0000,118C :2534 =0 ERROR2,RC[OD],Q : TRAP CGDES FAILED
U 106D, 0000,003C,0180,0800,0000,106E :2535 NOP
U 106E, 0000,003D,0180,0800,0000,1189 :2536 =0 ERLOOP
U 106F, 0810,0038,0180,0970,0000,1218 :2537 D,RC[OE]
U 1218, 0F00,003C,3180,3C00,0000,1219 :2538 ID[CES],D,D_0 : SET THE TRAP CODE BITS
U 1219, 0000,003C,3180,3C00,0000,121A :2539 SYNC08: ID[CES],D : SEE IF THEY CLEAR
U 121A, 0000,003C,31F0,2C00,0000,121B :2540 Q,ID[CES] : READ THEM
U 121B, 001C,0034,01C0,0A00,0000,121C :2541 Q-Q.AND,R[0] : MASK
U 121C, 001D,2000,0180,0800,0010,121D :2542 A[U,Q-D,CLK,UBCC : CHECK
U 121D, 0000,013C,0180,0800,0000,1070 :2543 Z?
U 1070, 0001,203D,0180,09E8,0000,118C :2544 =0 ERROR2,RC[OD],Q : TRAP CODE BITS DID NOT CLEAR
:2545 :
:2546 :+
:2547 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2548 :--
:2549 :

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U 1071. 0810,0038,6580,0970,0000,121E :2550      D RC[OE],KMX/.10      : GET EXPECTED DATA
U 121E. 0F19,0014,6580,09F0,0000,121F :2551      RC[OE],D+K[.10],D_0 : SELECT NEXT PATTERN
U 121F. 0000,003C,3D80,3C00,0000,1220 :2552      ID[PSL],D      : CLEAR THE IV BIT IN THE PSL
U 1220. 0810,0038,0180,0960,0000,1221 :2553      D RC[OC]
U 1221. 0019,8000,0580,09E0,0010,1222 :2554      RC[OC],D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
U 1222. 0000,013C,0180,0800,0000,1072 :2555      Z?
U 1072. 0000,003C,0180,0800,0000,106A :2556      =0      J/T157L1      : CONTINUE
:2557
:2558
:2559      :////////////////////
:2560
:2561      :+
:2562      : NOW CHECK ID BUS<6:4>=HHH
:2563      :-
:2564
U 1073. 0000,003C,0180,0800,0000,1074 :2565      T157S2: NOP
U 1074. 0000,003D,0980,0800,0084,71A5 :2566      =0      SETRCF[.2]
U 1075. 0000,003C,0180,0800,0000,1076 :2567      NOP
U 1076. 0000,003D,0180,0800,0000,11A3 :2568      =0      SUBTEST
U 1077. 0000,003C,0180,0A00,0000,1223 :2569      LAB RC[0]
U 1223. 0000,003C,0180,09F0,0000,1078 :2570      RC[OE],LA      : SET THE EXPECTED DATA
U 1078. 0000,003D,0180,0800,0000,1189 :2571      =0      ERLOOP
U 1079. 0810,0038,0180,0970,0000,1224 :2572      D RC[OE]
U 1224. 0000,003C,3180,3C00,0000,1225 :2573      SYNC09: ID[CES],D      : EXECUTE THE TEST
U 1225. 0000,003C,31F0,2C00,0000,1226 :2574      SYNC0A: Q_ID[CES]      : READ THE TRAP CODES BACK
U 1226. 001C,0034,01C0,0A00,0000,1227 :2575      Q-Q.AND.RC[0]      : MASK
U 1227. 001D,2000,0180,0800,0010,1228 :2576      A[U_Q-D,CLK.UBCC      : CHECK
U 1228. 0000,013C,0180,0800,0000,107A :2577      Z?
U 107A. 0001,203D,0180,09E8,0000,118C :2578      =0      ERROR2,RC[OD],Q      : TRAP CODES DID NOT SET
:2579
:2580
:2581      :////////////////////
:2582
:2583      :+
:2584      : CHECK TRAP CODE 0 FALSE=> ID BUS<6:4>=HLH*-PSL FU*-CCL7
:2585      :-
:2586
U 107B. 0003,003C,0180,0A88,0000,107C :2587      T157S3: RC[1],0      : INIT ADDRESS OF IB DATA
U 107C. 0000,003D,0180,0800,0000,11A3 :2588      =0      SUBTEST
U 107D. 0003,003C,0180,09F0,0000,107E :2589      RC[OE],0      : INIT EXPECTED DATA
U 107E. 2000,003D,0180,0A08,4200,11AB :2590      =0      ALU RC[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 107F. 0818,0038,7580,0800,0000,1229 :2591      D K[.20]      : SET THE IV BIT
U 1229. 0000,003C,3D80,3C00,0000,1080 :2592      ID[PSL],D      : IN THE PSL
U 1080. 0000,003D,0180,0800,0000,1189 :2593      =0      ERLOOP
U 1081. 0F00,003C,0180,0800,0000,122A :2594      D 0
U 122A. 0000,003C,3180,3C00,0000,122B :2595      ID[CES],D      : CLEAR THE TRAP CODES
U 122B. 0818,0038,3580,0800,0000,122C :2596      D K[.50]      : USE A CODE OF 5 ON THE TRAP CODES
U 122C. 0000,003C,3180,3C00,0020,122D :2597      SYNC0B: ID[CES],D,SET.V : EXECUTE THE TEST
U 122D. 0000,003C,3DF0,2C00,0000,122E :2598      Q_ID[PSL]      : READ THE TRAP CODE
U 122E. 0F19,2034,65C0,0800,0000,122F :2599      Q-Q.AND.K[.10],D_0 : MASK CODE ZERO
U 122F. 001D,2000,0180,0800,0010,1230 :2600      A[U_Q-D,CLK.UBCC      : CHECK
U 1230. 0000,013C,0180,0800,0000,1082 :2601      Z?
U 1082. 0001,203D,0180,09E8,0000,118C :2602      =0      ERROR2,RC[OD],Q      : TRAP CODE ZERO SET
:2603
:2604

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:2605 :////////////////////
:2606
:2607 :+
:2608 : TRAP CODE 0 FALSE=> ID BUS<6:4>=HLH*-PSL FU+CCL7*-ALU=0*-VDETECT SW*-PSL IV
:2609 :-
:2610
U 1083, 0F00,003C,0180,0800,0000,1231 :2611 T157S4: D 0
U 1231, 0000,003C,3D80,3C00,0000,1084 :2612 ID[PSL]_D : INIT THE PSL
U 1084, 0000,003D,0180,0800,0000,11A3 :2613 =0 SUBTEST
U 1085, 0000,003C,0180,0800,0000,1086 :2614 NOP
U 1086, 0000,003D,0180,0800,0000,1189 :2615 =0 ERLOOP
U 1087, 0F00,003C,0180,0800,0000,1232 :2616 D 0
U 1232, 0000,003C,3180,3C00,0000,1233 :2617 ID[CES]_D : INIT THE CES REGISTER
U 1233, 0818,0038,3580,0800,0000,1234 :2618 D K[.50] : SETUP TO WRITE CODE 5
U 1234, 0001,C03C,3180,3C00,0070,1235 :2619 SYNCOC: ID[CES]_D,ALU_D,SET.CC(INST) : EXECUTE THE TEST
U 1235, 0000,003C,31F0,2C00,0000,1236 :2620 Q_ID[CES] : GET THE TRAP CODE
U 1236, 0F19,2034,65C0,0800,0000,1237 :2621 Q-Q.AND.K[.10],D_0 : MASK
U 1237, 001D,2000,0180,0800,0010,1238 :2622 ALU_Q-D,CLK.UBCC : CHECK
U 1238, 0000,013C,0180,0800,0000,1088 :2623 Z?
U 1088, 0001,203D,0180,09E8,0000,118C :2624 =0 ERROR2,RC[OD]_Q : TRAP CODE ZERO SET
:2625
:2626 :////////////////////
:2627
:2628
:2629 :+
:2630 : TRAP CODE ZERO FALSE=> CCL7*EN IV TRAP*PSL IV*ID TO TRAP CODE*-ALU=0*-VDETECT SW
:2631 :-
:2632
U 1089, 0000,003C,0180,0800,0000,108A :2633 T157S5: NOP
U 108A, 0000,003D,0180,0800,0000,11A3 :2634 =0 SUBTEST
U 1088, 0818,0038,2580,0800,0000,1239 :2635 D K[.A0] : INIT THE PSL
U 1239, 0000,003C,3D80,3C00,0000,108C :2636 ID[PSL]_D
U 108C, 0000,003D,0180,0800,0000,1189 :2637 =0 ERLOOP
U 108D, 0F00,003C,0180,0800,0000,123A :2638 D 0
U 123A, 0000,003C,3180,3C00,0000,108E :2639 ID[CES]_D : INIT THE CES
U 108E, 0818,0039,D580,0800,0000,118E :2640 =0 D K[.6],CALL,J/DCO : GENERATE A TRAP CODE OF 6
U 108F, 0001,C03C,3180,3C00,0070,123B :2641 SYNCOC: ID[CES]_D,ALU_D,SET.CC(INST) : EXECUTE THE TEST
U 123B, 0000,003C,31F0,2C00,0000,123C :2642 Q_ID[CES] : READ THE CODES
U 123C, 0F19,2034,65C0,0800,0000,123D :2643 Q-Q.AND.K[.10],D_0 : MASK
U 123D, 001D,2000,0180,0800,0010,123E :2644 ALU_Q-D,CLK.UBCC : CHECK
U 123E, 0000,013C,0180,0800,0000,1090 :2645 Z?
U 1090, 0001,203D,0180,09E8,0000,118C :2646 =0 ERROR2,RC[OD]_Q : TRAP CODE 0 SET
:2647
:2648 :////////////////////
:2649
:2650
:2651 :+
:2652 : TRAP CODE 0 FALSE=>CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*ALU=0
:2653 :-
:2654
U 1091, 0000,003C,0180,0800,0000,1092 :2655 T157S6: NOP
U 1092, 0000,003D,0180,0800,0000,11A3 :2656 =0 SUBTEST
U 1093, 0818,0038,7580,0800,0000,123F :2657 D K[.20]
U 123F, 0000,003C,3D80,3C00,0000,1094 :2658 ID[PSL]_D : INIT THE PSL
U 1094, 0000,003D,0180,0800,0000,1189 :2659 =0 ERLOOP

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U 1095, 0F00,003C,0180,0800,0000,1240 :2660      D 0
U 1240, 0000,003C,3180,3C00,0000,1241 :2661      ID[CES] D          : INIT THE CES REG
U 1241, 0818,0038,35F8,0800,0000,1242 :2662      D K[.5C],Q 0      : GEN TRAP CODE OF 5
U 1242, 0001,E03C,3180,3C00,0070,1243 :2663      SYNCOE: ID[CES] D,ALU_Q,SET.CC(INST) : EXECUTE THE TEST
U 1243, 0000,003C,31F0,2C00,0000,1244 :2664      Q_ID[CES]          : READ THEM BACK
U 1244, 0F19,2034,65C0,0800,0000,1245 :2665      Q-Q.AND.K[.10],D_0    : MASK
U 1245, 001D,2000,0180,0800,0010,1246 :2666      ALU_Q-D,CLK.UBCC-      : CHECK
U 1246, 0000,013C,0180,0800,0000,1096 :2667      Z?
U 1096, 0001,203D,0180,09E8,0000,118C :2668      =0      ERROR2,RC[OD],Q      : TRAP CODE ZERO SET
:2669
:2670      ;////////////////////////////////////
:2671
:2672      ;+
:2673      ; TRAP CODE 0 FALSE=> CCL7*-EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*EALU<9:8>=01
:2674      ;-
:2675
U 1097, 0000,003C,0180,0800,0000,1098 :2676      T157S7: NOP
U 1098, 0000,003D,0180,0800,0000,11A3 :2677      =0      SUBTEST
U 1099, 0018,0038,0980,0A88,0000,109A :2678      R[1] K[.2]          : SET ADDRESS OF IB DATA
U 109A, 2000,003D,0180,0A08,4200,11AB :2679      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 109B, 0818,0038,7580,0800,0000,1247 :2680      D K[.20]
U 1247, 0000,003C,3D80,3C00,0000,1248 :2681      ID[PSL] D          : INIT THE PSL
U 1248, 0000,003C,6580,0800,0084,709C :2682      SC K[.10]          : INIT THE SC FOR EALU DATA
U 109C, 0000,003D,0180,0800,0000,1189 :2683      =0      ERLOP
U 109D, 0F00,003C,0180,0800,0000,1249 :2684      D 0
U 1249, 0000,003C,3180,3C00,0000,124A :2685      ID[CES] D          : INIT THE CES REGISTER
U 124A, 0818,0038,3580,0800,0000,124B :2686      D K[.50]          : SELECT A CODE OF 5
U 124B, 0000,C03C,3180,3C00,0070,124C :2687      SYNCOF: ID[CES] D,EALU_SC,SET.CC(INST) : EXECUTE THE TEST
U 124C, 0000,003C,31F0,2C00,0000,124D :2688      Q_ID[CES]          : READ THE TRAP CODES
U 124D, 0F19,2034,65C0,0800,0000,124E :2689      Q-Q.AND.K[.10],D_0    : MASK
U 124E, 001D,2000,0180,0800,0010,124F :2690      ALU_Q-D,CLK.UBCC-      : CHECK
U 124F, 0000,013C,0180,0800,0000,109E :2691      Z?
U 109E, 0001,203D,0180,09E8,0000,118C :2692      =0      ERROR2,RC[OD],Q      : TRAP CODE 0 SET
:2693
:2694      ;////////////////////////////////////
:2695
:2696      ;+
:2697      ; TRAP CODE 0 TRUE=> CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*-ALU=0
:2698      ;-
:2699
U 109F, 0018,0038,6580,09F0,0000,10A0 :2700      T157S8: RC[OE] K[.10] : INIT EXPECTED TRAP CODE
U 10A0, 0000,003D,0180,0800,0000,11A3 :2701      =0      SUBTEST
U 10A1, 0003,003C,0180,0A88,0000,1250 :2702      R[1] 0          : INIT ADDRESS OF IB DATA
U 1250, 0818,0038,7580,0800,0000,1251 :2703      D K[.20]
U 1251, 0000,003C,3D80,3C00,0000,10A2 :2704      ID[PSL] D          : INIT THE PSL
U 10A2, 2000,003D,0180,0A08,4200,11AB :2705      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT : LOAD THE IB
U 10A3, 0000,003C,0180,0800,0000,10A4 :2706      NOP
U 10A4, 0000,003D,0180,0800,0000,1189 :2707      =0      ERLGOP
U 10A5, 0F00,003C,0180,0800,0000,1252 :2708      D 0
U 1252, 0000,003C,3180,3C00,0000,1253 :2709      ID[CES] D          : INIT THE CES REGISTER
U 1253, 0818,0038,3580,0800,0000,1254 :2710      D K[.50]          : SET TRAP CODE OF 5
U 1254, 0001,C03C,3180,3C00,0070,1255 :2711      SYNC10: ID[CES] D,ALU_D,SET.CC(INST) : EXECUTE THE TEST
U 1255, 0000,003C,31F0,2C00,0000,1256 :2712      Q_ID[CES]          : GET THE TRAP CODES
U 1256, 0019,2034,65C0,0800,0000,1257 :2713      Q-Q.AND.K[.10]      : MASK
U 1257, 0810,0038,0180,0970,0000,1258 :2714      D_RC[OE]

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U 1258, 001D,2000,0180,0800,0010,1259 :2715      ALU_Q-D,CLK.UBCC      : CHECK
U 1259, 0000,013C,0180,0800,0000,10A6 :2716      Z?
U 10A6, 0001,203D,0180,09E8,0000,118C :2717      =0      ERROR2,RC[0D]_Q      : TRAP CODE 0 DID NOT SET
:2718
:2719
:2720 :////////////////////
:2721
:2722 :+
:2723 : TRAP CODE 0 TRUE=>CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*-ALU SIGN*AMX SI
:2724 :-
:2725
U 10A7, 0000,003C,0180,0800,0000,10A8 :2726 T157S9: NOP
U 10A8, 0000,003D,0180,0800,0000,11A3 :2727      =0      SUBTEST
U 10A9, 0018,0038,1180,0A88,0000,10AA :2728      R[1] K[.4]
U 10AA, 2000,003D,0180,0A08,4200,11AB :2729      =0      ALU R[1],FLUSH.IB,CALL,J/IBWAIT : SET ADDRESS OF IB DATA
U 10AB, 0818,0038,7580,0800,0000,125A :2730      D K[.20] : LOAD THE IB
U 125A, 0000,003C,3D80,3C00,0000,10AC :2731      ID[PSL]_D : INIT THE PSL
U 10AC, 0000,003D,0180,0800,0000,11AB :2732      =0      CALL,J/DISPAT : LATCH THE DATA TYPE
U 10AD, 0000,003C,0180,0800,0000,10AE :2733      NOP
U 10AE, 0000,003D,0180,0800,0000,1189 :2734      =0      ERLOOP
U 10AF, 0F00,003C,0180,0800,0000,125B :2735      D 0
U 125B, 0000,003C,3180,3C00,0000,10B0 :2736      ID[CES]_D : INIT THE CES REGISTER
U 10B0, 0818,0039,8980,0800,0000,118E :2737      =0      D_K[.D],CALL,J/DCO : GENERATE TRAP CODE 5 WITH THE SIGN BIT SET
U 10B1, 0018,0038,41C0,0800,0000,125C :2738      Q_K[.80] : SET THE SIGN BIT IN Q
U 125C, 001D,C014,3180,3C00,0070,125D :2739      SYNC11: ID[CES]_D,ALU_D+Q,SET.CC(INST) : EXECUTE THE TEST
U 125D, 0000,003C,31F0,2C00,0000,125E :2740      Q_ID[CES] : READ THE TRAP CODES
U 125E, 0019,2034,65C0,0800,0000,125F :2741      Q-Q.AND,K[.10] : MASK
U 125F, 0810,0038,0180,0970,0000,1260 :2742      D-RC[0E] : GET EXPECTED VALUE
U 1260, 001D,2000,0180,0800,0010,1261 :2743      ALU_Q-D,CLK.UBCC : CHECK
U 1261, 0000,013C,0180,0800,0000,10B2 :2744      Z?
U 10B2, 0001,203D,0180,09E8,0000,118C :2745      =0      ERROR2,RC[0D]_Q : TRAP CODE 0 DID NOT SET
:2746
:2747
:2748 :////////////////////
:2749
:2750 :+
:2751 : TRAP CODE 0 TRUE=> CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*ALU SIGN*-AMX S
:2752 :-
:2753
U 10B3, 0000,003C,0180,0800,0000,10B4 :2754 T157SA: NOP
U 10B4, 0000,003D,0180,0800,0000,11A3 :2755      =0      SUBTEST
U 10B5, 0818,0038,7580,0800,0000,1262 :2756      D K[.20]
U 1262, 0000,003C,3D80,3C00,0000,10B6 :2757      ID[PSL]_D : INIT THE PSL
U 10B6, 0000,003D,0180,0800,0000,1189 :2758      =0      ERLOOP
U 10B7, 0F00,003C,0180,0800,0000,1263 :2759      D 0
U 1263, 0000,003C,3180,3C00,0000,1264 :2760      ID[CES]_D : INIT THE CES
U 1264, 0818,0038,35C0,0800,0000,1265 :2761      D_K[.50],Q ALU : GET TRAP CODE 5
U 1265, 001D,C014,3180,3C00,0070,1266 :2762      SYNC12: ID[CES]_D,ALU_D+Q,SET.CC(INST) : EXECUTE THE TEST
U 1266, 0000,003C,31F0,2C00,0000,1267 :2763      Q_ID[CES] : READ THE TRAP CODES
U 1267, 0019,2034,65C0,0800,0000,1268 :2764      Q-Q.AND,K[.10] : MASK
U 1268, 0810,0038,0180,0970,0000,1269 :2765      D-RC[0E] : GET EXPECTED DATA
U 1269, 001D,2000,0180,0800,0010,126A :2766      ALU_Q-D,CLK.UBCC : CHECK
U 126A, 0000,013C,0180,0800,0000,10B8 :2767      Z?
U 10B8, 0001,203D,0180,09E8,0000,118C :2768      =0      ERROR2,RC[0D]_Q : TRAP CODE 0 DID NOT SET
:2769

```

```

:2770
:2771 :////////////////////
:2772
:2773 :+
:2774 : ID TO TRAP CODE FALSE=> ID BUS<6:4>=LLH*-PSL IV
:2775 :-
:2776
U 10B9. 0000.003C.0180.0800.0000.10BA :2777 T157SB: NOP
U 10BA. 0000.003D.0180.0800.0000.11A3 :2778 =0 SUBTEST
U 10BB. 0F03.003C.0180.09F0.0000.126B :2779 D 0,RC[OE]_0 ; SET EXPECTED VALUE OF TRAP CODES
U 126B. 0000.003C.3D80.3C00.0000.10BC :2780 ID[PSL]_D ; INIT THE PSL
U 10BC. 0000.003D.0180.0800.0000.1189 :2781 =0 ERLOOP
U 10BD. 0F00.003C.0180.0800.0000.126C :2782 D 0
U 126C. 0000.003C.3180.3C00.0000.126D :2783 ID[CES]_D ; INIT THE CES
U 126D. 0818.0038.6580.0800.0000.126E :2784 D_K[.10]
U 126E. 0000.003C.3180.3C00.0000.126F :2785 SYNC13: ID[CES]_D ; EXECUTE THE TEST
U 126F. 0000.003C.31F0.2C00.0000.1270 :2786 Q_ID[CES] ; READ THE TRAP CODES
U 1270. 0F1C.0034.01C0.0A00.0000.1271 :2787 Q-Q.AND.R[0],D 0 ; MASK
U 1271. 001D.2000.0180.0800.0010.1272 :2788 A[U_Q-D,CLK.UBCC ; CHECK
U 1272. 0000.013C.0180.0800.0000.109E :2789 Z?
U 10BE. 0001.203D.0180.09E8.0000.118C :2790 =0 ERROR2,RC[0D]_Q ; TRAP CODES DID NOT STAY ZERO
:2791 :////////////////////
:2792
:2793 :+
:2794 : ID TO TRAP CODE FALSE=> ID BUS<6:4>=HHL*-PSL DV
:2795 :-
:2796
U 10BF. 0000.003C.0180.0800.0000.10C0 :2797 T157SC: NOP
U 10C0. 0000.003D.0180.0800.0000.11A3 :2798 =0 SUBTEST
U 10C1. 0000.003C.0180.0800.0000.10C2 :2799 NOP
U 10C2. 0000.003D.0180.0800.0000.1189 :2800 =0 ERLOOP
U 10C3. 0F00.003C.0180.0800.0000.1273 :2801 D 0
U 1273. 0000.003C.3180.3C00.0000.1274 :2802 ID[CES]_D ; INIT THE CES
U 1274. 0818.0038.7980.0800.0000.1275 :2803 D_K[.30] ; GEN TRAP CODE 6
U 1275. 0500.003C.0180.0800.0000.1276 :2804 D-D.LEFT
U 1276. 0000.003C.3180.3C00.0000.1277 :2805 SYNC14: ID[CES]_D ; EXECUTE THE TEST
U 1277. 0000.003C.31F0.2C00.0000.1278 :2806 Q_ID[CES] ; GET THE TRAP CODES
U 1278. 0F1C.0034.01C0.0A00.0000.1279 :2807 Q-Q.AND.R[0],D 0 ; MASK
U 1279. 001D.2000.0180.0800.0010.127A :2808 A[U_Q-D,CLK.UBCC ; CHECK
U 127A. 0000.013C.0180.0800.0000.10C4 :2809 Z?
U 10C4. 0001.203D.0180.09E8.0000.118C :2810 =0 ERROR2,RC[0D]_Q ; TRAP CODES DID NOT REMAIN ZERO
:2811 :////////////////////
:2812
:2813 :+
:2814 : ID TO TRAP CODE TRUE=> ID<6:4>=HLH*PSL FU
:2815 :-
:2816
U 10C5. 0018.0038.3580.09F0.0000.10C6 :2817 T157SD: RC[OE]_K[.50] ; SET THE EXPECTED DATA
U 10C6. 0000.003D.0180.0800.0000.11A3 :2818 =0 SUBTEST
U 10C7. 0818.0038.3180.0800.0000.127B :2819 D_K[.40] ; INIT THE PSL
U 127B. 0000.003C.3D80.3C00.0000.10C8 :2820 ID[PSL]_D
U 10C8. 0000.003D.0180.0800.0000.1189 :2821 =0 ERLOOP

```

```

U 10C9. 0F00.003C.0180.0800.0000.127C :2825
U 127C. 0000.003C.3180.3C00.0000.127D :2826
U 127D. 0810.0038.0180.0970.0000.127E :2827
U 127E. 0000.003C.3180.3C00.0000.127F :2828
U 127F. 0000.003C.31F0.2C00.0000.1280 :2829
U 1280. 001C.0034.01C0.0A00.0000.1281 :2830
U 1281. 001D.2000.0180.0800.0010.1282 :2831
U 1282. 0000.013C.0180.0800.0000.10CA :2832
U 10CA. 0001.203D.0180.09E8.0000.118C :2833
U 10CB. 0000.003C.0180.0800.0000.10CC :2834
:2835
:2836
:2837
:2838
:2839
:2840
:2841
:2842
:2843
:2844
:2845
:2846
    
```

```

D_0
ID[CES] D
D_RC[OE]
SYNC15: ID[CES] D
Q_ID[CES]
Q-Q.AND.R[0]
A[U-Q-D,CLK.UBCC
Z?
=0 ERROR2,RC[0D]_Q
NOP
    
```

```

: INIT THE CES
: GET TRAP CODE OF 5
: EXECUTE THE TEST
: READ THE TRAP CODES
: MASK
: CHECK
: TRAP CODES INCORRECT
    
```

```

: THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
: 0
: SUBTEST 3, 4, 5, 6, AND 8
: $ 0033
: SUBTEST 7
: $ 0040
: SUBTEST 9 AND 10
: $ 6080
    
```

```

:2847 .PAGE 'TEST 158 PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE'
:2848 *****
:2849 +-
:2850 TEST 158 PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE
:2851
:2852 TEST DESCRIPTION
:2853 THIS TEST CHECKS THAT ALL THE BITS IN THE PSL REGISTER, EXCEPT
:2854 FOR THE 'TRAP PENDING' BIT, CLEAR ON AN INTERRUPT ACKNOWLEDGE, AND
:2855 THAT ALL THE BITS EXCEPT THE TP, PREVIOUS MODE, AND IPL BITS, CLEAR
:2856 ON AN EXCEPTION ACKNOWLEDGE.
:2857
:2858 SUBTST 1 - CHECK THE INTERRUPT ACKNOWLEDGE
:2859 SUBTST 2 - CHECK THE EXCEPTION ACKNOWLEDGE
:2860
:2861 LOGIC DESCRIPTION
:2862 THIS TEST CHECKS THE PSL REGISTER CLEAR INPUTS.
:2863
:2864 ERROR DESCRIPTION
:2865 DATA: EXPECTED PSL REGISTER
:2866 RECEIVED PSL REGISTER
:2867
:2868 SYNC POINT DESCRIPTION
:2869 SUBTST 1 - SYNC16--EXECUTE THE INTERRUPT ACKNOWLEDGE
:2870 SUBTST 2 - SYNC17--EXECUTE THE EXCEPTION ACKNOWLEDGE
:2871 --
:2872 *****
:2873 =0
:2874 T158: NEWTST[.2]
:2875 NOP
:2876 =0 CALL,J/UNJAM : CLEAR ANY SBI INTERRUPTS
:2877 D_K[.4] : GENERATE EXPECTED DATA
:2878 D_D.SWAP
:2879 RC[OE]_D : SAVE
:2880
:2881 :////////////////////
:2882
:2883 +-
:2884 FIRST CHECK THE INTERRUPT ACKNOWLEDGE
:2885 -
:2886
:2887 =0
:2888 T158S1: SUBTEST
:2889 NOP
:2890 =0 ERLOOP
:2891 D_0-K[.1] : SET PSL TO ALL ONES
:2892 ID[PSL]_D
:2893 SYNC16: D_RC[OE],ID[IBUF]_D,INTRPT.ACK : EXECUTE THE TEST
:2894 Q_ID[PSL] : GET THE PSL
:2895 ACU_G-D,CLK.UBCC : CHECK
:2896 Z?
:2897 =0 ERROR2,RC[OD]_Q : INCORRECT VALUE IN PSL
:2898
:2899 :////////////////////
:2900
:2901 +-

```

U 10CC, 0018,0039,0980,09F8,0000,1175
U 10CD, 0000,003C,0180,0800,0000,10CE
U 10CE, 0000,003D,0180,0800,0000,11B2
U 10CF, 0818,0038,1180,0800,0000,1283
U 1283, 0B00,003C,0180,0800,0000,1284
U 1284, 0001,003C,0180,09F0,0000,10D0

U 10D0, 0000,003D,0180,0800,0000,11A3
U 10D1, 0000,003C,0180,0800,0000,10D2
U 10D2, 0000,003D,0180,0800,0000,11B9
U 10D3, 081B,0000,0580,0800,0000,1285
U 1285, 0000,003C,3D80,3C00,0000,1286
U 1286, 0810,0038,0180,3D70,8000,1287
U 1287, 0000,003C,3DF0,2C00,0000,1288
U 1288, 001D,2000,0180,0800,0010,1289
U 1289, 0000,013C,0180,0800,0000,10D4
U 10D4, 0001,203D,0180,09E8,0000,118C


```

:2902 : NOW CHECK WITH EXCEPTION ACKNOWLEDGE
:2903 :-
:2904
U 10D5. 0000.003C.0180.0800.0000.10D6 :2905 T158S2: NOP
U 10D6. 0000.003D.0180.0800.0000.11A3 :2906 =0 SUBTEST
U 10D7. 0818.0038.AD80.0800.0000.128A :2907 D_K[.DFCF] ; GENERATE EXPECTED DATA
U 128A. 0819.0034.4D80.0800.0000.128B :2908 D_D.AND.K[.FF00]
U 128B. 0819.0014.1180.0800.0000.128C :2909 D_D+K[.4]
U 128C. 0800.003C.0180.0800.0000.128D :2910 D_D.SWAP
U 128D. 0001.003C.0180.09F0.0000.10D8 :2911 RC[OE]_D ; SAVE
U 10D8. 0000.003D.0180.0800.0000.1189 :2912 =0 ERLOOP
U 10D9. 081B.0000.0580.0800.0000.128E :2913 D_0-K[.1] ; LOAD PSL WITH ALL ONES
U 128E. 0000.003C.3D80.3C00.0000.128F :2914 ID[PSL]_D
U 128F. 0810.0038.0180.3D70.C000.1290 :2915 SYNC17: D_RC[OE],ID[IBUF]_D,EXCEPT.ACK ; EXECUTE THE TEST
U 1290. 0000.003C.3DF0.2C00.0000.1291 :2916 Q_ID[PSL] ; GET THE PSL
U 1291. 001D.2000.0180.0800.0010.1292 :2917 A[U_Q-D,CLK.UBCC] ; CHECK
U 1292. 0000.013C.0180.0800.0000.10DA :2918 Z?
U 10DA. 0001.203D.0180.09E8.0000.118C :2919 =0 ERROR2,RC[OD]_Q ; PSL BITS DID NOT CLEAR
U 10DB. 0000.003C.0180.0800.0000.10DC :2920 NOP
:2921
:2922

```

```

:2923 .PAGE 'TEST 159 PREVIOUS MODE BITS SELECTED BY 'CHK CHG MODE''
:2924 .....
:2925 +-
:2926 TEST 159 PREVIOUS MODE BITS SELECTED BY 'CHK CHG MODE'
:2927
:2928 TEST DESCRIPTION
:2929 THIS TEST CHECKS THAT THE PREVIOUS MODE BITS ARE SET FROM THE
:2930 CURRENT MODE BITS WHEN 'CHK CHG MODE' IS INVOKED DURING AN
:2931 ID BUS WRITE TO THE PSL.
:2932 THIS IS DONE BY INITIALIZING THE CURRENT MODE TO 01 AND THE PREV
:2933 MODE TO 10, EXECUTING THE TEST, AND CHECKING THE PREV MODE BITS
:2934 FOR 01. THEN THE COMPLIMENT PATTERN IS TESTED.
:2935
:2936 LOGIC DESCRIPTION
:2937 THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE PREVIOUS MODE BITS.
:2938
:2939 ERROR DESCRIPTION
:2940 DATA: EXPECTED PREVIOUS MODE BITS
:2941 RECEIVED PREVIOUS MODE BITS
:2942 LOOP COUNT -- 2= CURRENT MODE 01, 1= CURRENT MODE 10
:2943
:2944 SYNC POINT DESCRIPTION
:2945 ADDRESS SYNC18--LOAD THE PREVIOUS MODE FROM THE CURRENT MODE
:2946 --
:2947 .....
:2948 =0
:2949 T159: NEWTST
:2950 RC[0F] K[.3] ; THREE ARGUMENTS FOR TYPEOUT
:2951 =0 D_K[.C0] CALL,J/DC0 ; GENERATE THE MASK
:2952 Q=0,SC K[.8] ; SETUP SC FOR SHIFT
:2953 =0 CALL,J7DC3 ; D CONTAINS C003
:2954 D_D.SWAP
:2955 R[0]_D ; SAVE MASK = 03C00000
:2956 D_K[.1] ; GENERATE THE INITIAL DATA
:2957 D_D.SWAP
:2958 R[1]_D ; SAVE IN R1
:2959 D_K[.40] ; GENERATE THE EXPECTED DATA
:2960 D_DAL.SC ; D CONTAINS 4000
:2961 D_D+K[.1] ; D CONTAINS 4001
:2962 D_D.SWAP ; D CONTAINS 01400000
:2963 R[0E]_D ; SAVE
:2964
:2965 ;////////////////////
:2966
:2967 +-
:2968 CHECK THE 'CHECK CHANGE MODE' FUNCTION
:2969 -
:2970
:2971 RC[0C]_K[.2] ; SET THE LOOP COUNT
:2972 =0 ERLOOP
:2973 T159L1: D_R[1] ; GET INITIAL DATA
:2974 ID[PSL]_D ; INIT THE PSL
:2975 SYNC18: ID[PSL]_D,MSK/CHK.CHM ; EXECUTE THE TEST
:2976 Q_ID[PSL] ; READ THE PSL
:2977 Q_Q.AND.R[0] ; MASK

```

```

U 10DC, 0000,003D,0180,0800,0000,1175
U 10DD, 0018,0038,0D80,09F8,0000,10DE
U 10DE, 0818,0039,D180,0800,0000,118E
U 10DF, 0000,003C,01F8,0800,0084,70E0
U 10E0, 0000,003D,0180,0800,0000,1191
U 10E1, 0800,003C,0180,0800,0000,1293
U 1293, 0001,003C,0180,0A80,0000,1294
U 1294, 0818,0038,0580,0800,0000,1295
U 1295, 0800,003C,0180,0800,0000,1296
U 1296, 0001,003C,0180,0A88,0000,1297
U 1297, 0818,0038,3180,0800,0000,1298
U 1298, 0D00,003C,0180,0800,0000,1299
U 1299, 0819,0014,0580,0800,0000,129A
U 129A, 0800,003C,0180,0800,0000,129B
U 129B, 0001,003C,0180,09F0,0000,129C

```

```

U 129C, 0018,0038,0980,09E0,0000,10E2
U 10E2, 0000,003D,0180,0800,0000,1189
U 10E3, 0800,003C,0180,0A08,0000,129D
U 129D, 0000,003C,3D80,3C00,0000,129E
U 129E, 0000,003C,3D80,3C00,0400,129F
U 129F, 0000,003C,3DF0,2C00,0000,12A0
U 12A0, 001C,0034,01C0,0A00,0000,12A1

```

```

U 12A1, 0810,0038,0180,0970,0000,12A2 :2978      D RC[0E]
U 12A2, 001D,2000,0180,0800,0010,12A3 :2979      A[U_Q-D,CLK,UBCC]      ; CHECK
U 12A3, 0000,013C,0180,0800,0000,10E4 :2980      Z?
U 10E4, 0001,203D,0180,09E8,0000,118C :2981      =0      ERROR2,RC[0D],Q      ; PREVIOUS MODE BITS INCORRECT
:2982
:2983      ;+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
:2984      :-
:2985
:2986
U 10E5, 0818,0038,0980,0800,0000,12A4 :2987      D_K[.2]      ; GENERATE THE INITIAL DATA
U 12A4, 0800,003C,0180,0800,0084,72A5 :2988      D-D.SWAP,SC_K[.8]
U 12A5, 0001,003C,0180,0A88,0000,12A6 :2989      R[1],D      ; SAVE
U 12A6, 0818,0038,41F8,0800,0000,12A7 :2990      D_K[.80],Q_0      ; GENERATE THE EXPECTED DATA
U 12A7, 0D00,003C,0180,0800,0000,12A8 :2991      D-DAL,SC
U 12A8, 0819,0014,0980,0800,0000,12A9 :2992      D-D+K[.2]
U 12A9, 0800,003C,0180,0800,0000,12AB :2993      D-D.SWAP
U 12AB, 0001,003C,0180,09F0,0000,12AC :2994      RC[0E],D      ; SAVE EQUALS 02800000
U 12AC, 0810,0038,0180,0960,0000,12AD :2995      D RC[0C]
U 12AD, 0019,8000,0580,09E0,0010,12AE :2996      RC[0C],D-K[.1],CLK,UBCC,BYTE      ; DECREMENT LOP COUNT
U 12AE, 0000,013C,0180,0800,0000,10E6 :2997      Z?
U 10E6, 0000,003C,0180,0800,0000,10E3 :2998      =0      J/T159L1      ; CONTINUE
U 10E7, 0000,003C,0180,0800,0000,10E8 :2999      NOP
:3000
:3001
    
```

```

3002 PAGE 'TEST 15A CURRENT MODE BITS AND CHECK CHANGE MODE'
3003 *****
3004 **
3005 TEST 15A CURRENT MODE BITS AND CHECK CHANGE MODE
3006
3007 TEST DESCRIPTION
3008 THIS TEST CHECKS THAT THE CURRENT MODE BITS ARE LOADED
3009 CORRECTLY WHEN WRITTEN FROM THE ID BUS AND 'CHK CNG MODE' IS
3010 INVOKED. THE FOLLOWING TABLE SHOWS THE DATA PATTERNS AND EXPECTED
3011 CURRENT MODE FOR THOSE PATTERNS.
3012
3013          INITIAL CURRENT MODE      ID BUS      EXPECTED CURRENT MODE
3014          -----
3015          00                      00          00
3016                                01          00
3017                                10          00
3018                                11          00
3019          01                      00          00
3020                                01          01
3021                                10          01
3022                                11          01
3023          10                      00          00
3024                                01          01
3025                                10          10
3026                                11          10
3027          11                      00          00
3028                                01          01
3029                                10          10
3030                                11          11
3031
3032 LOGIC DESCRIPTION
3033 THIS TEST CHECKS THE CURRENT MODE AND ID BUS COMPARATOR AND
3034 THE MULTIPLEXOR THAT FEEDS THE CURRENT MODE BITS ON THE CEH MODULE.
3035
3036 ERROR DESCRIPTION
3037 DATA: EXPECTED CURRENT MODE BITS
3038        RECEIVED CURRENT MODE BITS
3039        LOOP COUNT FOR THE ID BUS DATA PATTERNS, I.E.
3040        4= 00, 3=01, 2=10, AND 1= 11
3041        LOOP COUNT FOR THE INITIAL CURRENT MODE, I.E.
3042        4= 00, 3= 01, 2= 10, 1= 11
3043
3044 SYNC POINT DESCRIPTION
3045 ADDRESS SYNC19--CURRENT MODE BITS ARE LOADED WITH 'CHK CNG MODE' INVOKED.
3046 --
3047 *****
3048 =0
3049 T15A: NEWTST[.4]
3050       D_K[.1]          : GENERATE AN INCREMENT VALUE
3051       D-D.SWAP          : FOR THE CURRENT MODE BITS
3052       R[1]_D            : SAVE
3053       R[0]_K[.8]        : SET ADDRESS OF EXPECTED DATA
3054       D_K[.3]           : GENERATE A MASK FOR THE CURRENT
3055       D-D.SWAP          : MODE BITS
3056       R[2]_D            : SAVE

```

```

U 10E8, 0018,0039,1180,09F8,0000,1175
U 10E9, 0818,0038,0580,0800,0000,12AF
U 12AF, 0800,003C,0180,0800,0000,1280
U 12B0, 0001,003C,0180,0A88,0000,12B1
U 12B1, 0018,0038,0180,0A80,0000,12B2
U 12B2, 0818,0038,0D80,0800,0000,12B3
U 12B3, 0800,003C,0180,0800,0000,12B4
U 12B4, 0001,003C,0180,0A90,0000,12B5

```



```

U 12B5, 0003,003C,0180,0AA0,0000,12B6 :3057          R[4]_0          ; INIT INITIAL VALUE OF CURRENT MODE BITS
:3058
:3059 ;////////////////////
:3060
:3061 ;+
:3062 ; START THE TEST
:3063 ;-
:3064
U 12B6, 0018,0038,1180,09D8,0000,12B7 :3065          RC[0B]_K[.4]          ; SET LOOP COUNT OF INITIAL VALUE
U 12B7, 0018,0038,1180,09E0,0000,12B8 :3066 T15AL1: RC[0C]_K[.4]          ; SET LOOP COUNT OF ID BUS DATA
U 12B8, 0003,003C,0180,0A98,0000,12B9 :3067          R[3]_0          ; INIT ID BUS DATA
U 12B9, 0000,003C,0180,0A00,0200,12BA :3068 T15AL2: VA R[0]          ; LAOD ADDRESS OF EXPECTED DATA
U 12BA, 0000,003C,0180,C800,0000,12BB :3069          D[ONG] CACHE.P          ; FETCH EXPECTED DATA
U 12BB, 0001,003C,0180,09F0,0000,10EA :3070          RC[0E]_D          ; SAVE
U 10EA, 0000,003D,0180,0800,0000,1189 :3071 =0          ERLOOP          ;
U 10EB, 0800,003C,0180,0A20,0000,12BC :3072          D R[4]          ; INIT THE PSL
U 12BC, 0000,003C,3D80,3C00,0000,12BD :3073          ID[PSL]_D          ;
U 12BD, 0800,003C,0180,0A18,0000,12BE :3074          D R[3]          ; GET ID BUS DATA
U 12BE, 0000,003C,3D80,3C00,0400,12BF :3075 SYNC19: ID[PSL] D, MSC/CHK.CHM ; EXECUTE THE TEST
U 12BF, 0810,0038,3DF0,2D70,0000,12C0 :3076          Q ID[PS], D RC[0E] ; READ THE PSL
U 12C0, 001C,0034,01C0,0A10,0000,12C1 :3077          Q-Q.AND.R[2] ; MASK
U 12C1, 001D,2000,0180,0800,0010,12C2 :3078          A[U_Q-D,CLK.UBCC ; CHECK
U 12C2, 0000,013C,0180,0800,0000,10EC :3079          Z?
U 10EC, 0001,203D,0180,09E8,0000,118C :3080 =0          ERROR2,RC[0D]_Q ; CURRENT MODE BITS INCORRECT
:3081
:3082 ;+
:3083 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
:3084 ;-
:3085
U 10ED, 0000,003C,0180,0A00,0000,12C3 :3086          LAB R[0]
U 12C3, 0018,0014,1180,0A80,0000,12C5 :3087          R[0] LA+K[.4]          ; INCREMENT ADR OF EXPECTED DATA
U 12C5, 0800,003C,0180,0A18,0000,12C6 :3088          D R[3]          ; INCREMENT ID BUS DATA
U 12C6, 0000,003C,0180,0A08,0000,12C7 :3089          LAB R[1]
U 12C7, 001C,2014,0180,0A98,0000,12C8 :3090          R[3] LA+D          ; ...
U 12C8, 0810,0038,0180,0960,0000,12C9 :3091          D RC[0C]
U 12C9, 0019,8000,0580,09E0,0010,12CA :3092          RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP
U 12CA, 0000,013C,0180,0800,0000,10EE :3093          Z?
U 10EE, 0000,003C,0180,0800,0000,12B9 :3094 =0          J/T15AL2          ; CONTINUE
U 10EF, 0800,003C,0180,0A20,0000,12CB :3095          D R[4]          ; INCREMENT DATA TO INIT CURRENT MODE
U 12CB, 0000,003C,0180,0A08,0000,12CC :3096          LAB R[1]
U 12CC, 001C,2014,0180,0AA0,0000,12CD :3097          R[4] LA+D          ; ...
U 12CD, 0810,0038,0180,0958,0000,12CE :3098          D RC[0B]
U 12CE, 0019,8000,0580,09D8,0010,12CF :3099          RC[0B]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 12CF, 0000,013C,0180,0800,0000,10F0 :3100          Z?
U 10F0, 0000,003C,0180,0800,0000,12B7 :3101 =0          J/T15AL1
U 10F1, 0000,003C,0180,0800,0000,10F2 :3102          NOP
:3103
:3104
:3105 ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
:3106 ;X 8
:3107 ;$ 0000,0000
:3108 ;$ 0000,0000
:3109 ;$ 0000,0000
:3110 ;$ 0000,0000
:3111 ;$ 0000,0000

```

D 9

7

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;3112      ;$ 0000,0100
;3113      ;$ 0000,0100
;3114      ;$ 0000,0100
;3115      ;$ 0000,0000
;3116      ;$ 0000,0100
;3117      ;$ 0000,0200
;3118      ;$ 0000,0200
;3119      ;$ 0000,0000
;3120      ;$ 0000,0100
;3121      ;$ 0000,0200
;3122      ;$ 0000,0300
;3123
;3124
;3125

```

```

:3126 .PAGE 'TEST 15B CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK'
:3127 *****
:3128 ++
:3129
:3130 TEST 15B CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK
:3131
:3132 TEST DESCRIPTION
:3133 THIS TEST CHECKS THAT THE PREVIOUS MODE BITS ARE LOADED FROM THE
:3134 CURRENT MODE BITS AND THAT THE CURRENT MODE BITS CLEAR WHEN AN
:3135 EXCEPTION ACK IS EXECUTED.
:3136
:3137 LOGIC DESCRIPTION
:3138 THIS TEST CHECKS PART OF THE LOGIC ON THE CEH MODULE THAT
:3139 CONTROLS THE LOADING OF THESE BITS.
:3140
:3141 ERROR DESCRIPTION
:3142 DATA: EXPECTED PSL
:3143 RECEIVED PSL
:3144
:3145 SYNC POINT DESCRIPTION
:3146 ADDRESS SYNC3C--CURRENT MODE AND PREV MODE BITS ARE LOADED
:3147 --
:3148 *****
:3149 =0
:3150 T15B: NEWTST[.2]
:3151 SC_K[.8],Q 0
:3152 =0 D_RC[.C],CAL,J/DCO ; GENERATE THE MASK
:3153 D_DAL.SC ; EQUALS 0000C000
:3154 Q-D,D D.SWAP ; GENERATE EXPECTED DATA
:3155 R[OE]_D,D_Q ; D CONTAINS 0000C000
:3156 D_D+K[.3] ; D CONTAINS 0000C003
:3157 D-D.SWAP ; D CONTAINS 03C00000
:3158 R[0]_D ; SAVE AS MASK
:3159 D_K[.3]
:3160 D-D.SWAP ; GENERATE INITIAL PSL DATA
:3161 R[1]_D
:3162
:3163 //////////////////////////////////////
:3164 +
:3165 START THE TEST
:3166 -
:3167
:3168 =0
:3169 T15BS1: ERLOOP
:3170 D_RC[1] ; INITIALIZE THE PSL
:3171 ID[PSL]_D ;
:3172 SYNC3C: EXCEPT_ACK,D_RC[OE] ; EXECUTE THE TEST
:3173 Q_ID[PSL] ; READ THE PSL BACK
:3174 Q-Q.AND,R[0] ; MASK
:3175 A[U_Q-D,CLK.UBCC ; CHECK
:3176 Z?
:3177 =0 ERROR2,R[0D]_Q ; PSL INCORRECT
:3178 NOP
:3179
```

U 10F2, 0018,0039,0980,09F8,0000,1175
U 10F3, 0000,003C,01F8,0800,0084,70F4
U 10F4, 0818,0039,8580,0800,0000,118E
U 10F5, 0D00,003C,0180,0800,0000,12D0
U 12D0, 0800,003C,01E0,0800,0000,12D1
U 12D1, 0C01,003C,0180,09F0,0000,12D2
U 12D2, 0819,0014,0D80,0800,0000,12D3
U 12D3, 0800,003C,0180,0800,0000,12D4
U 12D4, 0001,003C,0180,0A80,0000,12D5
U 12D5, 0818,0038,0D80,0800,0000,12D6
U 12D6, 0800,003C,0180,0800,0000,12D7
U 12D7, 0001,003C,0180,0A88,0000,10F6

U 10F6, 0000,003D,0180,0800,0000,1189
U 10F7, 0800,003C,0180,0A08,0000,12D8
U 12D8, 0000,003C,3D80,3C00,0000,12D9
U 12D9, 0810,0038,0180,0970,C000,12DA
U 12DA, 0000,003C,3DF0,2C00,0000,12DB
U 12DB, 001C,0034,01C0,0A00,0000,12DC
U 12DC, 001D,2000,0180,0800,0010,12DD
U 12DD, 0000,013C,0180,0800,0000,10F8
U 10F8, 0001,203D,0180,09E8,0000,118C
U 10F9, 0000,003C,0180,0800,0000,10FA

```

:3180 PAGE 'TEST 15C PSL 'IS' BIT LOAD DURING INTERRUPT ACKNOWLEDGE'
:3181 *****
:3182 ++
:3183 TEST 15C PSL 'IS' BIT AND INTERRUPT ACKNOWLEDGE
:3184
:3185 TEST DESCRIPTION
:3186 THIS TEST CHECKS THAT THE "INTERRUPT STACK" BIT IN THE PSL DOES
:3187 NOT GET LOADED WITH THE ID BUS DATA DURING AN INTERRUPT ACKNOWLEDGE.
:3188
:3189 LOGIC DESCRIPTION
:3190 THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE IS BIT IN THE PSL
:3191 AND THE LOAD SIGNAL ON THE IS BIT, ON THE CEH MODULE.
:3192
:3193 ERROR DESCRIPTION
:3194 DATA: EXPECTED IS BIT
:3195 RECEIVED IS BIT
:3196 LOOP COUNT -- 2= IS BIT SHOULD BE 0, 1= IS BIT SHOULD BE 1
:3197
:3198 SYNC POINT DESCRIPTION
:3199 ADDRESS SYNC1A--IS BIT GETS LOADED
:3200 --
:3201 *****
:3202 =0
:3203 T15C: NEWTST[.3]
:3204 RC[OE]_0 : INIT EXPECTED VALUE OF IS BIT
:3205 D_K[.4] : GENERATE MASK OF IS BIT
:3206 D-D.SWAP
:3207 RC[0]_D : SAVE
:3208 RC[1]_D
:3209
:3210 :////////////////////
:3211
:3212 ++
:3213 CHECK THE IS BIT
:3214 --
:3215
:3216 RC[OC]_K[.2] : SET THE LOOP COUNT
:3217 =0 ERLOOP
:3218 T15CL1: D RC[OE] : GET THE EXPECTED VALUE
:3219 ID[PSL]_D : LOAD THE IS BIT
:3220 D RC[0] : GET THE ID BUS DATA
:3221 SYNC1A: ID[IBUF]_D,INTRPT.ACK : EXECUTE THE TEST
:3222 Q_ID[PSL]_D,RC[OE] : READ THE IS BIT
:3223 Q-Q.AND.R[1] : MASK
:3224 A[U_Q-D,CLK.UBCC : CHECK
:3225 Z?
:3226 =0 ERROR2,RC[OD]_Q : IS BIT FAILED
:3227 LAB R[0] : GET THE ID BUS DATA
:3228 RC[OE]_LA : SET THE EXPECTED DATA
:3229 R[0]_0 : SET THE ID BUS DATA
:3230 D RC[OC]
:3231 R[OC]_D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
:3232 Z?
:3233 =0 J/T15CL1 : CONTINUE
:3234 NOP
```

```

U 10FA, 0018,0039,0D80,09F8,0000,1175
U 10FB, 0003,003C,0180,09F0,0000,12DE
U 12DE, 0818,0038,1180,0800,0000,12DF
U 12DF, 0800,003C,0180,0800,0000,12E0
U 12E0, 0001,003C,0180,0A80,0000,12E1
U 12E1, 0001,003C,0180,0A88,0000,12E2
```

```

U 12E2, 0018,0038,0980,09E0,0000,10FC
U 10FC, 0000,003D,0180,0800,0000,1189
U 10FD, 0810,0038,0180,0970,0000,12E3
U 12E3, 0000,003C,3D80,3C00,0000,12E4
U 12E4, 0800,003C,0180,0A00,0000,12E5
U 12E5, 0000,003C,0180,3C00,8000,12E6
U 12E6, 0810,0038,3DF0,2D70,0000,12E7
U 12E7, 001C,0034,01C0,0A08,0000,12E8
U 12E8, 001D,2000,0180,0800,0010,12E9
U 12E9, 0000,013C,0180,0800,0000,10FE
U 10FE, 0001,203D,0180,09E8,0000,118C
U 10FF, 0000,003C,0180,0A00,0000,12EA
U 12EA, 0000,003C,0180,09F0,0000,12EB
U 12EB, 0003,003C,0180,0A80,0000,12EC
U 12EC, 0810,0038,0180,0960,0000,12ED
U 12ED, 0019,8000,0580,09E0,0010,12EE
U 12EE, 0000,013C,0180,0800,0000,110A
U 110A, 0000,003C,0180,0800,0000,10FD
U 110B, 0000,003C,0180,0800,0000,1110
```


ZZ-ESKAH-V132 TEST 15C PSL 'IS' BIT LOAD DURING INTERRUPT ACKNOWLEDGE
ESKAH3A.MCR MICRO2 1M(01) 16-DEC-82 12:35:45

TEST 15C PSL

'IS' BIT

LOAD DU

G INTERRUPT

ACKNOWLEDGE

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;
;
;
;

[illegible]

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PAGE 'TEST 15D PSL TRAP PENDING (TP) BIT'
*****
++
TEST 15D PSL TRAP PENDING (TP) BIT

TEST DESCRIPTION
THIS TEST CHECKS THE PSL TP BIT.

SUBTST 1 - CHECK THAT THE PSL TP IS LOADED FROM ITSELF DURING
AN "IRD STATE" FUNCTION AND AN INSTRUCTION BUFFER STALL.
SUBTST 2 - CHECK THAT THE PSL TP BIT GETS THE PSL T BIT DURING AN
IRD STATE FUNCTION AND NO INSTRUCTION BUFFER STALL
SUBTST 3 - CHECK THAT THE PSL TP BIT GETS ID BUS BIT 30 DURING
AN INTERRUPT ACKNOWLEDGE.
SUBTST 4 - CHECK THAT THE PSL TP BIT GETS ID BUS BIT 30 DURING
AN EXCEPTION ACKNOWLEDGE.

LOGIC DESCRIPTION
THIS TEST CHECKS THE SELECT LINE ON THE MULTIPLEXOR THAT FEEDS
THE PSL TP BIT ON THE ICL MODULE.

ERROR DESCRIPTION
DATA: EXPECTED TP BIT
RECEIVED TP BIT
LOOP COUNT -- 2= PSL TP SHOULD BE 0, 1= PSL TP SHOULD BE 1

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC1B--LOAD THE TP BIT FROM ITSELF
SUBTST 2 - SYNC1C--LOAD THE TP BIT FROM THE PSL T BIT
SUBTST 3 - SYNC1D--LOAD THE TP BIT FROM ID BUS BIT 30
SUBTST 4 - SYNC1E--LOAD THE TP BIT FROM ID BUS BIT 30
--
*****
=0
T15D: NEWTST[.3]
RC[0]_K[.10] ; INIT THE PSL DATA
D_K[.40] ; GENERATE THE ID BUS DATA
D-D.SWAP
RC[1]_D ; EQUALS 40000000
RC[2]_D ; SAVE AS A MASK
RC[0E]_0 ; INIT THE EXPECTED DATA

:////////////////////

:++
: PSL TP_PSL TP=> -IACK*-EACK*-ID TO PSL*IRD STATE*(STALL+SVC)
:-

=0
T15DS1: SUBTEST
RC[0C]_K[.2],IBC/FLUSH ; SET LOOP COUNT AND INIT IB
ERLOOP
=0
T15DL1: D RC[0] ; INIT THE PSL
ID[PSL]_D ; GET ID BUS DATA
D_R[1]

```

```

U 1110, 0018,0039,0D80,09F8,0000,1175
U 1111, 0018,0038,6580,0A80,0000,12EF
U 12EF, 0818,0038,3180,0800,0000,12F0
U 12F0, 0800,003C,0180,0800,0000,12F1
U 12F1, 0001,003C,0180,0A88,0000,12F2
U 12F2, 0001,003C,0180,0A90,0000,12F3
U 12F3, 0003,003C,0180,09F0,0000,1112

U 1112, 0000,003D,0180,0800,0000,11A3
U 1113, 2018,0038,0980,09E0,0000,1114
U 1114, 0000,003D,0180,0800,0000,1189
U 1115, 0800,003C,0180,0A00,0000,12F4
U 12F4, 0000,003C,3D80,3C00,0000,12F5
U 12F5, 0800,003C,0180,0A08,0000,12F6

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U 12F6, 0000,003C,0180,3C00,1000,12F7 :3293
U 12F7, 0810,0038,3DF0,2D70,0000,12F8 :3294
U 12F8, 001C,0034,01C0,0A10,0000,12F9 :3295
U 12F9, 001D,2000,0180,0800,0010,12FA :3296
U 12FA, 0000,013C,0180,0800,0000,1116 :3297
U 1116, 0001,203D,0180,09E8,0000,118C :3298
U 1117, 0000,003C,0180,0A08,0000,12FB :3299
U 12FB, 0000,003C,0180,0A80,0000,12FC :3300
U 12FC, 0000,003C,0180,09F0,0000,12FD :3301
U 12FD, 0003,003C,0180,0A88,0000,12FE :3302
U 12FE, 0810,0038,0180,0960,0000,12FF :3303
U 12FF, 0019,8000,0580,09E0,0010,1300 :3304
U 1300, 0000,013C,0180,0800,0000,1118 :3305
U 1118, 0000,003C,0180,0800,0000,1115 :3306

```

SYNC1B: ID[IBUF] D, MSC/IRD      ; EXECUTE THE TEST
      Q_ID[PSL] D RC[OE]        ; READ THE PSL
      Q-Q.AND.R[2]              ; MASK
      ACU_Q-D, CLK.UBCC         ; CHECK
      Z?
=0    ERROR2, RC[OD]_Q          ; PSL TP FAILED
      LAB R[1]                  ; GET DATA WITH TP ON
      RC[0] LA                  ; SET PSL DATA
      RC[OE] LA                 ; SET EXPECTED DATA
      R[1] 0                    ; SET ID BUS DATA
      D RC[OC]
      RC[OC]_D-K[.1], CLK.UBCC, BYTE ; CHECK THE LOOP COUNT
      Z?
=0    J/T15DL1                  ; CONTINUE

```

;;

```

;+
; PSL TP_PSL T=> -IACK*-EACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
;-

```

U 1119, 0000,003C,0180,0A10,0000,1301 :3315
U 1301, 0000,003C,0180,0A80,0000,111A :3316
U 111A, 0000,003D,0180,0800,0000,11A3 :3317
U 111B, 0000,003C,0180,0A88,0000,1302 :3318
U 1302, 0003,003C,0180,09F0,0000,111C :3319
U 111C, 2018,0039,1180,0800,4200,11AB :3320
U 111D, D018,0038,0980,09E0,0000,111E :3321
U 111E, 0000,003D,0180,0800,0000,1189 :3322
U 111F, 0800,003C,0180,0A00,0000,1303 :3323
U 1303, 0000,003C,3D80,3C00,0000,1304 :3324
U 1304, 0800,003C,0180,0A08,0000,1305 :3325
U 1305, 0000,003C,0180,3C00,1000,1306 :3326
U 1306, 0810,0038,3DF0,2D70,0000,1307 :3327
U 1307, 001C,0034,01C0,0A10,0000,1309 :3328
U 1309, 001D,2000,0180,0800,0010,130A :3329
U 130A, 0000,013C,0180,0800,0000,1120 :3330
U 1120, 0001,203D,0180,09E8,0000,118C :3331
U 1121, 0018,0038,6580,0A80,0000,130B :3332
U 130B, 0003,003C,0180,0A88,0000,130C :3333
U 130C, 0000,003C,0180,0A10,0000,130D :3334
U 130D, 0000,003C,0180,09F0,0000,130E :3335
U 130E, 0810,0038,0180,0960,0000,130F :3336
U 130F, 0019,8000,0580,09E0,0010,1310 :3337
U 1310, 0000,013C,0180,0800,0000,1122 :3338
U 1122, 0000,003C,0180,0800,0000,111F :3339

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T15DS2: LAB R[2]
      RC[0] LA                  ; INIT THE PSL DATA
      SUBTEST
      R[1] LA                  ; INIT THE ID BUS DATA
      RC[OE] 0                 ; INIT THE EXPECTED DATA
=0    ALU K[.4], FLUSH.IB, CALL, J/IBWAIT ; LOAD THE IB
      RC[OC]_K[.2], IBC/CLR.1 ; SET THE LOOP COUNT & GET OUT OF EP1
=0    ERLOOP
T15DL2: D RC[0]                ; INIT THE PSL
      ID[PSL]_D
      D RC[1]                  ; GET THE ID BUS DATA
      SYNC1C: ID[IBUF] D, MSC/IRD ; EXECUTE THE TEST
      Q_ID[PSL] D RC[OE]        ; GET THE PSL
      Q-Q.AND.R[2]              ; MASK
      ACU_Q-D, CLK.UBCC         ; CHECK
      Z?
=0    ERROR2, RC[OD]_Q          ; PSL TP INCORRECT
      RC[0]_K[.10]             ; INIT THE PSL DATA
      R[1] 0                   ; INIT THE ID BUS DATA
      LAB R[2]
      RC[OE] LA                 ; INIT THE EXPECTED DATA
      D RC[OC]
      RC[OC]_D-K[.1], CLK.UBCC, BYTE ; CHECK THE LOOP COUNT
      Z?
=0    J/T15DL2                  ; CONTINUE

```

;;

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;+
; PSL TP_ID 30=> IACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
;-

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3341
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3343
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3346
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U 1123, 0000,003C,6580,0A10,0000,1311 :3348 T15DS3: LAB R[2],KMX/.10
U 1311, 0018,0014,6580,0A80,0000,1124 :3349 R[0] LA+K[.10] ; INIT THE PSL DATA
U 1124, 0000,003D,0180,0800,0000,11A3 :3350 =0 SUBTEST
U 1125, 0003,003C,0180,09F0,0000,1312 :3351 RC[OE]_0 ; INIT THE EXPECTED DATA
U 1312, 0003,003C,0180,0A88,0000,1313 :3352 R[1]_0 ; INIT ID BUS DATA
:3353
U 1313, 0018,0038,0980,09E0,0000,1126 :3354 RC[OC]_K[.2] ; SET THE LOOP COUNT
U 1126, 0000,003D,0180,0800,0000,1189 :3355 =0 ERLOOP
U 1127, 0800,003C,0180,0A00,0000,1314 :3356 T15DL3: D R[0]
U 1314, 0000,003C,3D80,3C00,0000,1315 :3357 ID[PSL]_D ; INIT THE PSL
U 1315, 0800,003C,0180,0A08,0000,1316 :3358 D R[1] ; GET THE ID BUS DATA
U 1316, 0000,003C,0180,3C00,9000,1317 :3359 SYNC1D: ID[IBUF] D, MSC/IRD, INTRPT.ACK ; EXECUTE THE TEST
U 1317, 0810,0038,3DF0,2D70,0000,1318 :3360 Q_ID[PSL]_D RC[OE] ; GET THE PSL
U 1318, 001C,0034,01C0,0A10,0000,1319 :3361 Q-Q.AND.R[2] ; MASK
U 1319, 001D,2000,0180,0800,0010,131A :3362 ACU_Q-D, CLK.UBCC ; CHECK
U 131A, 0000,013C,0180,0800,0000,1128 :3363 Z?
U 1128, 0001,203D,0180,09E8,0000,118C :3364 =0 ERROR2, RC[OD]_Q ; TP BIT FAILED
U 1129, 0000,003C,0180,0A10,0000,131B :3365 LAB R[2]
U 131B, 0000,003C,0180,09F0,0000,131C :3366 RC[OE] LA ; SET THE EXPECTED DATA
U 131C, 0000,003C,0180,0A88,0000,131D :3367 R[1] LA ; SET THE ID BUS DATA
U 131D, 0003,003C,0180,0A80,0000,131E :3368 R[0]_0 ; SET THE PSL DATA
U 131E, 0810,0038,0180,0960,0000,131F :3369 D RC[OC]
U 131F, 0019,8000,0580,09E0,0010,1320 :3370 RC[OC]_D-K[.1], CLK.UBCC, BYTE ; CHECK THE LOOP COUNT
U 1320, 0000,013C,0180,0800,0000,112A :3371 Z?
U 112A, 0000,003C,0180,0800,0000,1127 :3372 =0 J/T15DL3 ; CONTINUE
:3373
:3374 ;////////////////////
:3375
:3376
:3377 ;+ PSL TP_ID 30=> EACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
:3378 ;-
:3379
U 112B, 0000,003C,6580,0A10,0000,1321 :3380 T15DS4: LAB R[2],KMX/.10
U 1321, 0018,0014,6580,0A80,0000,112C :3381 R[0] LA+K[.10] ; INIT THE PSL DATA
U 112C, 0000,003D,0180,0800,0000,11A3 :3382 =0 SUBTEST
U 112D, 0003,003C,0180,09F0,0000,1322 :3383 RC[OE]_0 ; INIT THE EXPECTED DATA
U 1322, 0003,003C,0180,0A88,0000,1323 :3384 R[1]_0 ; INIT ID BUS DATA
:3385
U 1323, 0018,0038,0980,09E0,0000,112E :3386 RC[OC]_K[.2] ; SET THE LOOP COUNT
U 112E, 0000,003D,0180,0800,0000,1189 :3387 =0 ERLOOP
U 112F, 0800,003C,0180,0A00,0000,1324 :3388 T15DL4: D R[0]
U 1324, 0000,003C,3D80,3C00,0000,1325 :3389 ID[PSL]_D ; INIT THE PSL
U 1325, 0800,003C,0180,0A08,0000,1326 :3390 D R[1] ; GET THE ID BUS DATA
U 1326, 0000,003C,0180,3C00,0000,1327 :3391 SYNC1E: ID[IBUF] D, MSC/IRD, EXCEPT.ACK ; EXECUTE THE TEST
U 1327, 0810,0038,3DF0,2D70,0000,1328 :3392 Q_ID[PSL]_D RC[OE] ; GET THE PSL
U 1328, 001C,0034,01C0,0A10,0000,1329 :3393 Q-Q.AND.R[2] ; MASK
U 1329, 001D,2000,0180,0800,0010,132A :3394 ACU_Q-D, CLK.UBCC ; CHECK
U 132A, 0000,013C,0180,0800,0000,1130 :3395 Z?
U 1130, 0001,203D,0180,09E8,0000,118C :3396 =0 ERROR2, RC[OD]_Q ; TP BIT FAILED
U 1131, 0000,003C,0180,0A10,0000,132B :3397 LAB R[2]
U 132B, 0000,003C,0180,09F0,0000,132C :3398 RC[OE] LA ; SET THE EXPECTED DATA
U 132C, 0000,003C,0180,0A88,0000,132D :3399 R[1] LA ; SET THE ID BUS DATA
U 132D, 0003,003C,0180,0A80,0000,132E :3400 R[0]_0 ; SET THE PSL DATA
U 132E, 0810,0038,0180,0960,0000,132F :3401 D RC[OC]
U 132F, 0019,8000,0580,09E0,0010,1330 :3402 RC[OC]_D-K[.1], CLK.UBCC, BYTE ; CHECK THE LOOP COUNT

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ZZ-ESKAH-V132 TEST 15D PSL TRAP PENDING (TP) BIT
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SEQ 1140
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U 1330, 0000,013C,0180,0800,0000,1132	:3403		Z?	
U 1132, 0000,003C,0180,0800,0000,112F	:3404	=0	J/T15DL4	: CONTINUE
U 1133, 0000,003C,0180,0800,0000,1134	:3405		NOP	
	:3406			

```

3407 .PAGE "TEST 15E PSL BITS THAT ARE A FUNCTION OF 'LOAD FPD'"
3408 .....
3409 .++
3410 .TEST 15E PSL BITS THAT ARE A FUNCTION OF 'LOAD FPD'
3411 .
3412 .TEST DESCRIPTION
3413 .THIS TEST CHECKS THOSE BITS OF THE PSL THAT GET LOADED WHEN A
3414 . 'LOAD FPD' FUNCTION IS EXECUTED.
3415 .
3416 .SUBTST 1 - CHECK THAT THE FPD BIT SETS, INDEPENDENT OF THE ID BUS,
3417 . WHEN A 'SET FPD' FUNCTION IS EXECUTED.
3418 .SUBTST 2 - CHECK THAT THE COMPATABILITY MODE AND CURRENT MODE BITS
3419 . REMAIN UNCHANGED AND THAT THE FPD BIT CLEARS ON A 'CLR FPD'
3420 . FUNCTION.
3421 .SUBTST 3 - CHECK THAT THE FPD AND COMPATABILITY MODE BITS CLEAR
3422 . WHEN EXECUTING A 'SET FPD' AND 'EXCEPTION ACKNOWLEDGE'
3423 . FUNCTION SIMULTANEOUSLY.
3424 .
3425 .LOGIC DESCRIPTION
3426 .THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT LOADS THE
3427 . FPD, CM, AND CUR MODE BITS DURING THE EXECUTION OF A SET OR CLR FPD
3428 . FUNCTION. ('LOAD FPD' IS ASSERTED)
3429 .
3430 .ERROR DESCRIPTION
3431 .DATA: EXPECTED PSL
3432 .RECEIVED PSL
3433 .
3434 .SYNC POINT DESCRIPTION
3435 .SUBTST 1 - SYNC1F--EXECUTE THE 'LOAD FPD'
3436 .SUBTST 2 - SYNC20--EXECUTE THE 'LOAD FPD'
3437 .SUBTST 3 - SYNC21--EXECUTE THE 'LOAD FPD' AND EXCEPTION ACK.
3438 .--
3439 .....
3440 =0
3441 T15E: NEWTST[.2]
3442 D_K[.88] ; GENERATE A MASK OF THE BITS
3443 D_D+K[.3] ; D EQUALS 88
3444 D_D.SWAP ; EQUALS 8B000000
3445 R[2]_D ; SAVE
3446 R[0]_0 ; INIT INITIAL VALUE OF PSL
3447 R[1]_D ; SAVE AS ID BUS DATA
3448 D_K[.8] ; GENERATE THE EXPECTED DATA
3449 D_D.SWAP ; D EQUALS 0B000000
3450 R[0E]_D ; SAVE
3451 .....
3452 :////////////////////
3453 .+
3454 .FIRST CHECK THAT 'SET FPD' SETS THE FPD BIT
3455 .-
3456 .-
3457 .
3458 =0
3459 T15E1: SUBTEST
3460 NOP
3461 =0 ERLOOP

```

U 1134, 0018,0039,0980,09F8,0000,1175
U 1135, 0818,0038,C580,0800,0000,1331
U 1331, 0819,0014,0D80,0800,0000,1332
U 1332, 0800,003C,0180,0800,0000,1333
U 1333, 0001,003C,0180,0A90,0000,1334
U 1334, 0003,003C,0180,0A80,0000,1335
U 1335, 0001,003C,0180,0A88,0000,1336
U 1336, 0818,0038,0180,0800,0000,1337
U 1337, 0800,003C,0180,0800,0000,1338
U 1338, 0001,003C,0180,09F0,0000,1136

U 1136, 0000,003D,0180,0800,0000,11A3
U 1137, 0000,003C,0180,0800,0000,1138
U 1138, 0000,003D,0180,0800,0000,11B9

```

U 1139. 0800.003C.0180.0A00.0000.1339 :3462      D R[0]                ; INIT THE PSL
U 1339. 0000.003C.3D80.3C00.0000.133A :3463      ID[PSL]_D
U 133A. 0800.003C.0180.0A08.0000.133B :3464      D R[1]                ; GET ID BUS DATA
U 133B. 0000.003C.0180.3C00.2400.133D :3465 SYNC1F: ID[IBUF]_D, MSC/SET.FPD ; EXECUTE THE TEST
U 133D. 0810.0038.3DF0.2D70.0000.133E :3466      Q ID[PSL]_D, R[OE]    ; GET THE PSL
U 133E. 001C.0034.01C0.0A10.0000.133F :3467      Q-Q.AND.R[2]          ; MASK
U 133F. 001D.2000.0180.0800.0010.1340 :3468      ACU_Q-D, CLK.UBCC    ; CHECK
U 1340. 0000.013C.0180.0800.0000.113A :3469      Z?
U 113A. 0001.203D.0180.09E8.0000.118C :3470 =0      ERROR2, R[OD]_Q    ; SET FPD FAILED ON A BIT
:3471
:3472 :////////////////////
:3473
:3474 :+
:3475 : NOW CHECK THE "CLR FPD" FUNCTION
:3476 :-
:3477
U 113B. 0000.003C.0180.0A10.0000.1341 :3478 T15ES2: LAB R[2]
U 1341. 0000.003C.0180.0A80.0000.113C :3479      R[0] LA                ; INIT THE PSL DATA
U 113C. 0000.003D.0180.0800.0000.11A3 :3480 =0      SUBTEST
U 113D. 0003.003C.0180.0A88.0000.1342 :3481      R[1] 0                ; INIT THE ID BUS DATA
U 1342. 0818.0038.4180.0800.0000.1343 :3482      D_K[-80]
U 1343. 0819.0014.0D80.0800.0000.1344 :3483      D-D+K[.3]            ; GENERATE THE EXPECTED DATA
U 1344. 0800.003C.0180.0800.0000.1345 :3484      D-D.SWAP
U 1345. 0001.003C.0180.09F0.0000.113E :3485      R[OE]_D              ; EQUALS 83000000
U 113E. 0000.003D.0180.0800.0000.1189 :3486 =0      ERLOOP
U 113F. 0800.003C.0180.0A00.0000.1346 :3487      D R[0]
U 1346. 0000.003C.3D80.3C00.0000.1347 :3488      ID[PSL]_D            ; INIT THE PSL
U 1347. 0800.003C.0180.0A08.0000.1348 :3489      D R[1]                ; GET ID BUS DATA
U 1348. 0000.003C.0180.3C00.2000.1349 :3490 SYNC20: ID[IBUF]_D, MSC/CLR.FPD ; EXECUTE THE TEST
U 1349. 0810.0038.3DF0.2D70.0000.134A :3491      Q ID[PSL]_D, R[OE]    ; READ THE PSL
U 134A. 001C.0034.01C0.0A10.0000.134B :3492      Q-Q.AND.R[2]          ; MASK
U 134B. 001D.2000.0180.0800.0010.134C :3493      ACU_Q-D, CLK.UBCC    ; MASK
U 134C. 0000.013C.0180.0800.0000.1140 :3494      Z?
U 1140. 0001.203D.0180.09E8.0000.118C :3495 =0      ERROR2, R[OD]_Q    ; A BIT FILAED IN THE PSL
:3496
:3497 :////////////////////
:3498
:3499 :+
:3500 : NOW CHECK THE "LOAD FPD" WITH EXCEPTION ACK
:3501 :-
:3502
U 1141. 0000.003C.0180.0A10.0000.134D :3503 T15ES3: LAB R[2]
U 134D. 0000.003C.0180.0A80.0000.1142 :3504      R[0] LA                ; INIT THE PSL DATA
U 1142. 0000.003D.0180.0800.0000.11A3 :3505 =0      SUBTEST
U 1143. 0000.003C.0180.0A88.0000.134E :3506      R[1] LA                ; INIT THE ID BUS DATA
U 134E. 0003.003C.0180.09F0.0000.1144 :3507      R[OE]_0              ; INIT THE EXPECTED DATA
U 1144. 0000.003D.0180.0800.0000.1189 :3508 =0      ERLOOP
U 1145. 0800.003C.0180.0A00.0000.1350 :3509      D R[0]
U 1350. 0000.003C.3D80.3C00.0000.1351 :3510      ID[PSL]_D            ; INIT THE PSL
U 1351. 0800.003C.0180.0A08.0000.1352 :3511      D R[1]                ; GET THE ID BUS DATA
U 1352. 0000.003C.0180.3C00.E400.1354 :3512 SYNC21: ID[IBUF]_D, MSC/SET.FPD, EXCEPT.ACK ; EXECUTE THE TEST
U 1354. 0810.0038.3DF0.2D70.0000.1355 :3513      Q ID[PSL]_D, R[OE]    ; GET THE PSL
U 1355. 001C.0034.01C0.0A10.0000.1356 :3514      Q-Q.AND.R[2]          ; MASK
U 1356. 001D.2000.0180.0800.0010.1357 :3515      ACU_Q-D, CLK.UBCC    ; MASK
U 1357. 0000.013C.0180.0800.0000.1146 :3516      Z?

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SEO 1143
Page 8

; BIT IN PSL DID NOT CLEAR

```

3522 PAGE 'TEST 15F VECTOR REGISTER DATA INTEGRITY BITS <31:16>'
3523 *****
3524 ++
3525 TEST 15F VECTOR REGISTER DATA INTEGRITY BITS <31:16>
3526
3527 TEST DESCRIPTION
3528 THIS TEST CHECKS THE DATA INTEGRITY AND THE PRIORITY ENCODE FUNCTION
3529 OF THE VECTOR REGISTER BITS <31:16>.
3530
3531 SUBTST 1 - FILL BITS <31:16> WITH ONES AND CHECK THAT THE 'NUMBER
3532 OF ONES' BITS (<20:16>), ARE CORRECT. THE TEST PATTERN
3533 IS AS FOLLOWS: 00000000, 00010000, 00030000, 00070000,
3534 000F0000, 001F0000, 003F0000, 007F0000, .....,
3535 FFFF0000.
3536 SUBTST 2 - FLOAT A ONE THRU BITS <31:15> OF THE VECTOR REGISTER
3537 AND CHECK THAT THE PRIORITY BITS (<24:21>) ARE CORRECT.
3538
3539 LOGIC DESCRIPTION
3540 THIS TEST CHECKS THE LOGIC ON THE CEP MODULE THAT GENERATES THE
3541 UPPER 16 BITS OF THE VECTOR REGISTER, I.E. THE 'NUMBER OF ONES'
3542 CIRCUIT AND THE 'PRIORITY' CIRCUIT. IT ALSO CHECKS THE ID BUS INTERFACE
3543 TO THE VECTOR REGISTER.
3544
3545 ERROR DESCRIPTION
3546 DATA: EXPECTED CONTENTS OF THE VECTOR REGISTER
3547 RECEIVED CONTENTS OF THE VECTOR REGISTER
3548 LOOP COUNT
3549 SUBTST 1 - INDICATES THE NUMBER OF ONES BEING LOADED INTO
3550 THE VECTOR REGISTER, I.E. 11=0, 10=1, F=2,
3551 E=3, D=4, C=5, ETC.
3552 SUBTST 2 - INDICATES THE BIT POSITION OF THE FLOATING ONE,
3553 I.E. 11= BIT 15, 10= BIT 16, F= BIT 17, E= BIT 18, ETC.
3554
3555 SYNC POINT DESCRIPTION
3556 SUBTST 1 - SYNC22--VECTOR REGISTER GETS LOADED WITH THE TEST PATTERN
3557 SYNC23--VECTOR REGISTER IS READ ON THE ID BUS
3558 SUBTST 2 - SYNC24--VECTOR REGISTER IS LOADED WITH THE TEST PATTERN
3559 SYNC25--VECTOR REGISTER IS READ ON THE ID BUS
3560 --
3561 *****
3562 =0
3563 T15F: NEWTST[.3]
3564 D_K[.8000] ; SET INPUT GENERATOR VALUE
3565 R[0]_D,D_D.LEFT ; SAVE AND SET EXPECTED INCREMENT VALUE
3566 R[2]_D ; SAVE
3567 D_K[FFFF] ; GENERATE A MASK
3568 D-D.SWAP
3569 R[1]_D ; SAVE IN R1
3570 RC[OE]_0 ; INITIALIZE EXPECTED VALUE
3571 RC[3]_0 ; INITIALIZE ID BUS DATA
3572
3573 :////////////////////
3574
3575 ++
3576 : FIRST CHECK THE NUMBER OF ONES CIRCUIT
    
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U 1148, 0018,0039,0D80,09F8,0000,1175
U 1149, 0818,0038,4580,0800,0000,1358
U 1358, 0501,003C,0180,0A80,0000,1359
U 1359, 0001,003C,0180,0A90,0000,135A
U 135A, 0818,0038,C180,0800,0000,135B
U 135B, 0B00,003C,0180,0800,0000,135C
U 135C, 0001,003C,0180,0A88,0000,135D
U 135D, 0003,003C,0180,09F0,0000,135E
U 135E, 0003,003C,0180,0A98,0000,114A
    
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:3577 :-
:3578
:3579 =0
U 114A. 0000.003D.0180.0800.0000.11A3 :3580 T15FS1: SUBTEST
U 114B. 0818.0038.2180.0800.0000.135F :3581 D_K[.14] : GENERATE A LOOP COUNT
U 135F. 0019.0000.0D80.09E0.0000.114C :3582 RC[0C]_D-K[.3] : EQUALS 11(16)
U 114C. 0000.003D.0180.0800.0000.1189 :3583 =0 ERLOOP
U 114D. 0F00.003C.0180.0800.0000.1360 :3584 T15FL1: D_0
U 1360. 0000.003C.3580.3C00.0000.1361 :3585 ID[VECTOR]_D : INITIALIZE THE VECTOR REGISTER
U 1361. 0800.003C.0180.0A18.0000.1362 :3586 D_R[3] : GET THE TEST PATTERN
U 1362. 0000.003C.3580.3C00.0000.1363 :3587 SYNC22: ID[VECTOR]_D : EXECUTE THE TEST
U 1363. 0810.0038.35F0.2D70.0000.1364 :3588 SYNC23: Q_ID[VECTOR]_D_RC[0E] : READ THE VECTOR REGISTER
U 1364. 001C.0034.01C0.0A08.0000.1365 :3589 Q_Q.AND.R[1] : MASK
U 1365. 001D.2000.0180.0800.0010.1366 :3590 ACU_Q-D.CLK.UBCC : CHECK
U 1366. 0000.013C.0180.0800.0000.114E :3591 Z?
U 114E. 0001.203D.0180.09E8.0000.118C :3592 =0 ERROR2,RC[0D]_Q : VECTOR REGISTER FAILED
:3593
:3594 :+
:3595 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3596 :-
:3597
U 114F. 0818.0038.0980.0800.0000.1367 :3598 D_K[.2] : INSERT THE PRIORITY VALID BIT
U 1367. 0800.003C.0180.0800.0000.1368 :3599 D_D.SWAP : INTO THE EXPECTED DATA
U 1368. 0811.0030.0180.0970.0000.1369 :3600 D_D.OR.RC[0E]
U 1369. 0000.003C.0180.0A10.0000.136A :3601 LAB R[2] : GET THE INCREMENT VALUE FOR THE EXPECTED D
U 136A. 001C.2014.0180.09F0.0000.136B :3602 RC[0E]_LA+D : SET THE NEXT EXPECTED VALUE
U 136B. 0800.003C.0180.0A18.0000.136C :3603 D_R[3] : GET THE ID BUS GENERATOR VALUE
U 136C. 0000.003C.0180.0A00.0000.136D :3604 LAB R[0] : GET THE ID BUS DATA
U 136D. 083C.2014.0180.0800.0000.136E :3605 D_ACU.LEFT,ALU_LA[A+B]D : GENERATE NEXT VALUE OF ID BUS DATA
U 136E. 0001.003C.0180.0A98.0000.136F :3606 R[3]_D : SAVE
U 136F. 0810.0038.0180.0960.0000.1370 :3607 D_RC[0C]
U 1370. 0019.8000.0580.09E0.0010.1371 :3608 RC[0C]_D-K[.1],CLK.UBCC,BYTE : DECREMENT THE LOOP COUNT
U 1371. 0000.013C.0180.0800.0000.1150 :3609 Z?
U 1150. 0000.003C.0180.0800.0000.114D :3610 =0 J/T15FL1 : CONTINUE
:3611
:3612
:3613 :////////////////////
:3614
:3615 :+
:3616 : NOW CHECK THE PRIORITY BITS
:3617 :-
:3618
U 1151. 0018.0038.4580.0A98.0000.1372 :3619 T15FS2: R[3]_K[.8000] : SET THE INITIAL ID BUS DATA
U 1372. 0000.003C.01F8.0800.0084.7152 :3620 SC_K[.8],Q_0
U 1152. 0000.003D.0180.0800.0000.11A3 :3621 =0 SUBTEST
U 1153. 0818.0038.0580.0800.0000.1373 :3622 D_K[.1] : GENERATE THE INITIAL EXPECTED VALUE
U 1373. 0D00.003C.0180.0800.0000.1374 :3623 D_DAL.SC : D EQUALS 100
U 1374. 0819.0014.0980.0800.0000.1375 :3624 D_D+K[.2] : D EQUALS 102
U 1375. 0800.003C.0180.0800.0000.1376 :3625 D_D.SWAP : D EQUALS 02010000
U 1376. 0001.003C.0180.0AA8.0000.1377 :3626 R[5]_D : SAVE
U 1377. 0003.003C.0180.09F0.0000.1378 :3627 RC[0E]_0
U 1378. 0818.0038.7580.0800.0000.1379 :3628 D_K[.20] : GENERATE THE INCREMENT FOR THE
U 1379. 0D00.003C.0180.0800.0000.137A :3629 D_DAL.SC : EXPECTED DATA
U 137A. 0800.003C.0180.0800.0000.137B :3630 D_D.SWAP : SAVE
U 137B. 0001.003C.0180.0A90.0000.137F :3631 R[2]_D

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;3632
U 137F, 0818,0038,6580,0800,0000,1380 ;3633
U 1380, 0019,0014,0580,09E0,0000,1156 ;3634
U 1156, 0000,003D,0180,0800,0000,1189 ;3635
U 1157, 0F00,003C,0180,0800,0000,1381 ;3636
U 1381, 0000,003C,3580,3C00,0000,1382 ;3637
U 1382, 0800,003C,0180,0A18,0000,1383 ;3638
U 1383, 0000,003C,3580,3C00,0000,1384 ;3639
U 1384, 0810,0038,35F0,2D70,0000,1385 ;3640
U 1385, 001C,0034,01C0,0A08,0000,1386 ;3641
U 1386, 001D,2000,0180,0800,0010,1387 ;3642
U 1387, 0000,013C,0180,0800,0000,1158 ;3643
U 1158, 0001,203D,0180,09E8,0000,118C ;3644
U 1159, 0800,003C,0180,0A18,0000,1388 ;3645
U 1388, 0500,003C,0180,0800,0000,1389 ;3646
U 1389, 0001,003C,0180,0A98,0000,138A ;3647
U 138A, 0810,0038,0180,0970,0010,138B ;3648
U 138B, 0000,013C,0180,0A28,0000,115A ;3649
U 115A, 0000,003C,0180,0800,0000,138C ;3650
U 115B, 0000,003C,0180,09F0,0000,138E ;3651
U 138C, 0000,003C,0180,0A10,0000,138D ;3652
U 138D, 001C,2014,0180,09F0,0000,138E ;3653
U 138E, 0810,0038,0180,0960,0000,1391 ;3654
U 1391, 0019,8000,0580,09E0,0010,1392 ;3655
U 1392, 0000,013C,0180,0800,0000,115C ;3656
U 115C, 0000,003C,0180,0800,0000,1157 ;3657
U 115D, 0000,003C,0180,0800,0000,115E ;3658
;3659

D_KC.10]
RC[0C]_D+K[.1] ; SET THE LOOP COUNT
=0 ERLOOP
T15FL2: D 0
ID[VECTOR]_D ; INIT HTE VECTOR REGISTER
D RC[3] ; GET THE TEST PATTERN
SYNC24: ID[VECTOR] D ; EXECUTE THE TEST
SYNC25: Q_ID[VECTOR],D_RC[0E] ; READ THE VECTOR REGISTER
Q-Q.AND.R[1] ; MASK
ACU_Q-D,CLK.UBCC ; CHECK
Z?
=0 ERROR2,RC[0D]_Q ; VECTOR REGISTER FAILED
D RC[3] ; GENERATE THE NEXT INPUT PATTERN
D-D.LEFT
RC[3] D ; SAVE
D_RC[0E],CLK.UBCC ; GENERATE THE EXPECTED VALUE
Z?,LAB_R[5] ; BRANCH IF ZERO
=0 J/T9P1
RC[0E] LA,J/T9P2
T9P1: LAB_R[2]
RC[0E] LA+D ; ...
T9P2: D RC[0C]
RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
Z?
=0 J/T15FL2 ; CONTINUE
NOP

```



```

:3660 .PAGE 'TEST 160 SOFTWARE INTERRUPT REQUEST REGISTER'
:3661 *****
:3662 ++
:3663 TEST 160 SOFTWARE INTERRUPT REQUEST REGISTER
:3664
:3665 TEST DESCRIPTION
:3666 THIS TEST FLOATS A ZERO AND A ONE THRU THE LOWER 16 BITS OF THE
:3667 SOFTWARE INTERRUPT REQUEST REGISTER.
:3668
:3669 SUBTST 1 - FLOAT A ZERO THRU THE REGISTER
:3670 SUBTST 2 - FLOAT A ONE THRU THE REGISTER
:3671
:3672 LOGIC DESCRIPTION
:3673 THIS TEST CHECKS THE SOFTWARE INTERRUPT REQUEST REGISTER
:3674 ON THE CEH AND ICL MODULE AND THE ID BUS INTERFACE TO THE REGISTER.
:3675
:3676 ERROR DESCRIPTION
:3677 DATA: EXPECTED SIR
:3678 RECEIVED SIR
:3679 LOOP COUNT -- DEFINES THE BIT CURRENTLY BEING TESTED.
:3680 10= BIT 0, F= BIT 1, E= BIT 2, ETC.
:3681
:3682 SYNC POINT DESCRIPTION
:3683 SUBTST 1 - SYNC38--SIR IS LOADED WITH THE PATTERN
:3684 SYNC39--SIR IS READ OVER THE ID BUS
:3685 SUBTST 2 - SYNC3A--SIR IS LOADED WITH THE PATTERN
:3686 SYNC3B--SIR IS READ OVER THE ID BUS
:3687 --
:3688 *****
:3689 =0
U 115E, 0018,0039,0D80,09F8,0000,1175 :3690 T160: NEWTST[.3]
:3691
:3692 :////////////////////
:3693 +
:3694 FIRST FLOAT A ZERO THRU THE SIR REGISTER
:3695 -
:3696
:3697 T160S1: D_K[.FFFFC] ; GENERATE THE INITIAL TEST PATTERN
:3698 D_D.SXT[WORD]+K[.2] ; ...
:3699 R[0]_D
:3700 R[1]_D ; SAVE AS A MASK
:3701 =0 SUBTEST,R[0E]_D ; SAVE AS EXPECTED DATA
:3702 R[0C]_K[.10] ; SET THE LOOP COUNT
:3703 =0 ERLOOP
:3704 T160L2: D_R[0] ; GET THE TEST PATTERN
:3705 SYNC38: ID[SIR]_D ; LOAD THE REGISTER
:3706 SYNC39: Q_ID[SIR],D_R[0E] ; READ IT BACK
:3707 A[U,Q-D,CLK-UBCC,WORD] ; CHECK
:3708 BEN7Z
:3709 =0 ERROR2,R[0D]_Q,WORD ; BIT STUCK IN SIR
:3710 Q_R[0] ; GET THE TEST PATTERN
:3711 Q-Q.LEFT,S1/MUL- ; GENERATE NEXT PATTERN
:3712 R[0]_Q,D_Q ; SAVE
:3713 D_D.AND,R[1] ; MASK
:3714 R[0E]_D ; SET EXPECTED DATA

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U 139E, 0810,0038,0180,0960,0000,139F :3715      D RC[OC]
U 139F, 0019,8000,0580,09E0,0010,13A0 :3716      RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 13A0, 0000,013C,0180,0800,0000,1166 :3717      BEN/Z
U 1166, 0000,003C,0180,0800,0000,1163 :3718      J/T160L2 ; CONTINUE
:3719
:3720 :////////////////////
:3721 :+
:3722 : NOW FLOAT A ONE THRU THE REGISTER
:3723 :-
:3724
U 1167, 0018,0038,0580,0A80,0000,1168 :3725      T160S2: RC[O] K[.1] ; SET THE INITIAL TEST PATTERN
U 1168, 0003,003D,0180,09F0,0000,11A3 :3726      =0 SUBTEST,RC[OE]_0 ; SET INITIAL EXPECTED DATA
U 1169, 0018,0038,6580,09E0,0000,116A :3727      RC[OC]_K[.10] ; SET THE LOOP COUNT
U 116A, 0000,003D,0180,0800,0000,1189 :3728      =0 ERLOOP
U 116B, 0800,003C,0180,0A00,0000,13A1 :3729      T160L1: D RC[O] ; GET TEST PATTERN
U 13A1, 0000,003C,3980,3C00,0000,13A2 :3730      SYNC3A: ID[SIR] D ; LOAD THE PATTERN
U 13A2, 0810,0038,39F0,2D70,0000,13A3 :3731      SYNC3B: Q_ID[SIR],D RC[OE] ; READ IT BACK
U 13A3, 0019,2034,C1C0,0800,0000,13A4 :3732      Q-Q.AND.K[.FFFF] ; MASK
U 13A4, 001D,2000,0180,0800,0010,13A5 :3733      A[U Q-D,CLK.UBCC ; CHECK
U 13A5, 0000,013C,0180,0800,0000,116C :3734      BEN72
U 116C, 0001,203D,0180,09E8,0000,118C :3735      =0 ERROR2,RC[OD]_Q ; BIT STUCK IN SIR REG
U 116D, 0800,003C,0180,0A00,0000,13A6 :3736      D RC[O] ; GET CURRENT PATTERN
U 13A6, 0500,003C,0180,0800,0000,13A7 :3737      D-D.LEFT ; GENERATE NEXT PATTERN
U 13A7, 0001,003C,0180,0A80,0000,13A8 :3738      RC[O] D ; SAVE
U 13A8, 0001,003C,0180,09F0,0000,13A9 :3739      RC[OE] D ; ...
U 13A9, 0810,0038,0180,0960,0000,13AA :3740      D RC[OC]
U 13AA, 0019,8000,0580,09E0,0010,13AB :3741      RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP
U 13AB, 0000,013C,0180,0800,0000,116E :3742      BEN/Z
U 116E, 0000,003C,0180,0800,0000,116B :3743      =0 J/T160L1 ; CONTINUE
U 116F, 0000,003C,0180,0800,0000,13AC :3744      NOP
:3745
:3746
U 13AC, 0000,003D,0180,0800,0000,1175 :3747      ENDTST: NEWTST
:3748
    
```

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000 - OFFF Unused								
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2032=	2033=	2034=	2035=	2036=	2037=	2038=	2039=
U 1010	2069=	2071=	2074=	2076=	2079=	2081=	2114=	2115=
U 1018	2127=	2128=	2129=	2130=	2132=	2133=	2135=	2141=
U 1020	2148=	2149=	2181=	2182=	2191=	2192=	2194=	2195=
U 1028	2198=	2199=	2249=	2250=	2258=	2259=	2260=	2261=
U 1030	2270=	2271=	2273=	2274=	2283=	2284=	2295=	2296=
U 1038	2297=	2298=	2299=	2300=	2302=	2303=	2312=	2313=
U 1040	2318=	2319=	2320=	2321=	2322=	2323=	2325=	2326=
U 1048	2335=	2336=	2345=	2346=	2347=	2348=	1920:	1846
U 1050	2349=	2350=	2352=	2353=	2366=	2367=	2373=	2374=
U 1058	2398=	2399=	1924:	1869	2427=	2428=	1928:	1870
U 1060	2432=	2433=	2437=	2438=	2508=	2509=	2510=	2511=
U 1068	2521=	2522=	2527=	2528=	2534=	2535=	2536=	2537=
U 1070	2544=	2550=	2556=	2565=	2566=	2567=	2568=	2569=
U 1078	2571=	2572=	2578=	2587=	2588=	2589=	2590=	2591=
U 1080	2593=	2594=	2602=	2611=	2613=	2614=	2615=	2616=
U 1088	2624=	2633=	2634=	2635=	2637=	2638=	2640=	2641=
U 1090	2646=	2655=	2656=	2657=	2659=	2660=	2668=	2676=
U 1098	2677=	2678=	2679=	2680=	2683=	2684=	2692=	2700=
U 10A0	2701=	2702=	2705=	2706=	2707=	2708=	2717=	2726=
U 10A8	2727=	2728=	2729=	2730=	2732=	2733=	2734=	2735=
U 10B0	2737=	2738=	2745=	2754=	2755=	2756=	2758=	2759=
U 10B8	2768=	2777=	2778=	2779=	2781=	2782=	2790=	2798=
U 10C0	2799=	2800=	2801=	2802=	2811=	2820=	2821=	2822=
U 10C8	2824=	2825=	2833=	2834=	2874=	2875=	2876=	2877=
U 10D0	2888=	2889=	2890=	2891=	2897=	2905=	2906=	2907=
U 10D8	2912=	2913=	2919=	2920=	2949=	2950=	2951=	2952=
U 10E0	2953=	2954=	2972=	2973=	2981=	2987=	2998=	2999=
U 10E8	3049=	3050=	3071=	3072=	3080=	3086=	3094=	3095=
U 10F0	3101=	3102=	3150=	3151=	3152=	3153=	3169=	3170=
U 10F8	3177=	3178=	3203=	3204=	3217=	3218=	3226=	3227=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1871	3233=	3234=	1840:	1841:	1842:	1843:
U 1110	3272=	3273=	3287=	3288=	3289=	3290=	3298=	3299=
U 1118	3306=	3315=	3317=	3318=	3320=	3321=	3322=	3323=
U 1120	3331=	3332=	3339=	3348=	3350=	3351=	3355=	3356=
U 1128	3364=	3365=	3372=	3380=	3382=	3383=	3387=	3388=
U 1130	3396=	3397=	3404=	3405=	3441=	3442=	3459=	3460=
U 1138	3461=	3462=	3470=	3478=	3480=	3481=	3486=	3487=
U 1140	3495=	3503=	3505=	3506=	3508=	3509=	3517=	3518=
U 1148	3563=	3564=	3580=	3581=	3583=	3584=	3592=	3598=
U 1150	3610=	3619=	3621=	3622=	1872	2435:	3635=	3636=
U 1158	3644=	3645=	3650=	3651=	3657=	3658=	3690=	3697=
U 1160	3701=	3702=	3703=	3704=	3709=	3710=	3718=	3725=
U 1168	3726=	3727=	3728=	3729=	3735=	3736=	3743=	3744=
U 1170	1873	1874	1875	1882	1883	1897	1898	1899
U 1178	1900	1901	1902	1903	1904	1905	1906	1907
U 1180	1908	1909	1910	1911	1912	1913	1914	1915
U 1188	1916	1917	1918	1919	1922	1923	1966	1967
U 1190	1968	1969	1970	1971	1972	1973	1974	1975
U 1198	1976	1977	1978	1979	1980	1981	1983	1984

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	1985	1986	1988	1998	1999	2007	2008	2009
U 11A8	2013	2014	2040	2050	2051	2052	2053	2054
U 11B0	2055	2056	2064	2065	2066	2067	2068	2072
U 11B8	2073	2077	2078	2082	2083	2116	2117	2124
U 11C0	2125	2126	2134	2142	2143	2144	2145	2146
U 11C8	2147	2183	2196	2197	2262	2263	2264	2265
U 11D0	2266	2267	2268	2269	2272	2285	2286	2287
U 11D8	2288	2289	2290	2291	2292	2293	2294	2301
U 11E0	2314	2315	2316	2317	2324	2337	2338	2339
U 11E8	2340	2341	2342	2343	2344	2351	2354	2355
U 11F0	2356	2368	2369	2370	2371	2372	2376	2377
U 11F8	2378	2379	2380	2381	2382	2383	2384	2385
U 1200	2386	2387	2388	2389	2390	2391	2392	2393
U 1208	2394	2395	2396	2397	2429	2430	2431	2436
U 1210	2523	2524	2525	2529	2530	2531	2532	2533
U 1218	2538	2539	2540	2541	2542	2543	2551	2552
U 1220	2553	2554	2555	2570	2573	2574	2575	2576
U 1228	2577	2592	2595	2596	2597	2598	2599	2600
U 1230	2601	2612	2617	2618	2619	2620	2621	2622
U 1238	2623	2636	2639	2642	2643	2644	2645	2658
U 1240	2661	2662	2663	2664	2665	2666	2667	2681
U 1248	2682	2685	2686	2687	2688	2689	2690	2691
U 1250	2703	2704	2709	2710	2711	2712	2713	2714
U 1258	2715	2716	2731	2736	2739	2740	2741	2742
U 1260	2743	2744	2757	2760	2761	2762	2763	2764
U 1268	2765	2766	2767	2780	2783	2784	2785	2786
U 1270	2787	2788	2789	2803	2804	2805	2806	2807
U 1278	2808	2809	2810	2823	2826	2827	2828	2829
U 1280	2830	2831	2832	2878	2879	2892	2893	2894
U 1288	2895	2896	2908	2909	2910	2911	2914	2915
U 1290	2916	2917	2918	2955	2956	2957	2958	2959
U 1298	2960	2961	2962	2963	2971	2974	2975	2976
U 12A0	2977	2978	2979	2980	2988	2989	2990	2991
U 12A8	2992	2993	2434:	2994	2995	2996	2997	3051
U 12B0	3052	3053	3054	3055	3056	3057	3065	3066
U 12B8	3067	3068	3069	3070	3073	3074	3075	3076
U 12C0	3077	3078	3079	3087	2025:	3088	3089	3090
U 12C8	3091	3092	3093	3096	3097	3098	3099	3100
U 12D0	3154	3155	3156	3157	3158	3159	3160	3161
U 12D8	3171	3172	3173	3174	3175	3176	3205	3206
U 12E0	3207	3208	3216	3219	3220	3221	3222	3223
U 12E8	3224	3225	3228	3229	3230	3231	3232	3274
U 12F0	3275	3276	3277	3278	3291	3292	3293	3294
U 12F8	3295	3296	3297	3300	3301	3302	3303	3304
U 1300	3305	3316	3319	3324	3325	3326	3327	3328
U 1308	2016:	3329	3330	3333	3334	3335	3336	3337
U 1310	3338	3349	3352	3354	3357	3358	3359	3360
U 1318	3361	3362	3363	3366	3367	3368	3369	3370
U 1320	3371	3381	3384	3386	3389	3390	3391	3392
U 1328	3393	3394	3395	3398	3399	3400	3401	3402
U 1330	3403	3443	3444	3445	3446	3447	3448	3449
U 1338	3450	3463	3464	3465	2017:	3466	3467	3468
U 1340	3469	3479	3482	3483	3484	3485	3488	3489

Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	3490	3491	3492	3493	3494	3504	3507	2018:
U 1350	3510	3511	3512	2019:	3513	3514	3515	3516
U 1358	3565	3566	3567	3568	3569	3570	3571	3582
U 1360	3585	3586	3587	3588	3589	3590	3591	3599
U 1368	3600	3601	3602	3603	3604	3605	3606	3607
U 1370	3608	3609	3620	3623	3624	3625	3626	3627
U 1378	3628	3629	3630	3631	2020:	2021:	2022:	3633
U 1380	3634	3637	3638	3639	3640	3641	3642	3643
U 1388	3646	3647	3648	3649	3652	3653	3654	2023:
U 1390	2024:	3655	3656	3698	3699	3700	3705	3706
U 1398	3707	3708	3711	3712	3713	3714	3715	3716
U 13A0	3717	3730	3731	3732	3733	3734	3737	3738
U 13A8	3739	3740	3741	3742	3747			
U 13B0 - 13EF	Unused							
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

MICRO2 1M(01)

16-DEC-82 12:35:45

ESKODEF	0
ESKOOMAC	0
ESKAHMAC	0
ESKAH3A	957

Used	957
Remaining	

```
Total microwords used in memory U: 957
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

333

16-DEC-82 12:35:45

ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH3A.MIC

```
Pass 1 warnings:    0    Pass 2 warnings:    0
Pass 1 errors:      0    Pass 2 errors:      0
```

CCCC	CCCC	CCCC	CCCC
CCCC	CCCC	CCCC	CCCC

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2353	TEST 161 INTERVAL COUNTER
: 2689	TEST 162 IPL ACTIVE BITS IN THE SIR REGISTER & IPL_IPL ACTIVE IN PSL
: 2882	TEST 163 BRANCH ENABLE E -- INTERRUPT
: 2965	TEST 164 INTERRUPT REQUEST COMPARATOR
: 3171	TEST 165 INSTRUCTION BUFFER SERVICE BIT GENERATION
: 3293	TEST 166 HALT PENDING BIT
: 3493	TEST 167 PC REGISTER INCREMENT BY 'N' WITH 'SAVE' ACTIVE

22-ESKAH-V132
ESKAH3B.MCR

Subroutines

MICRO2

TM(01)

16-DEC-82

12:39:56

M 10

SEQ 1155
Page

:1
:1804
:1805

.NOLIST
.LIST

.LIST

U 1100.	0000,003C,19C0,0A78,0084,7001
U 1101.	0000,003C,05C0,0A78,0084,7001
U 1102.	0000,003C,09C0,0A78,0084,7001
U 1103.	0000,003C,0DC0,0A78,0084,7001
U 1104.	0000,003C,11C0,0A78,0084,7001
U 1105.	0000,003C,D5C0,0A78,0084,7001
U 1106.	0000,003C,D9C0,0A78,0084,7001
U 1107.	0000,003C,5DC0,0A78,0084,7001
U 1108.	0000,003C,01C0,0A78,0084,7001
U 110C.	0000,003C,85C0,0A78,0084,7001
U 110D.	0000,003C,89C0,0A78,0084,7001
U 110E.	0000,003C,65C0,0A78,0084,7001
U 110F.	0000,003C,61C0,0A78,0084,716B
U 1001.	0001,2024,0180,0800,0010,1006
U 1006.	0000,013C,0180,0800,0000,1002
U 1002.	0001,2036,0180,0AF8,0000,0000

:1806
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 :1858
 :1859
 :1860

REGION/1000.13FF

```

: FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
: WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
: R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
: THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
: THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

```

```

: FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
: 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
: ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
: R[OF] AND DO A RETURN.

```

```
: IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
: READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
: TO THE CONSOLE.
```

```

: THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
: ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
: EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
: RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
: STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

```

```

1100: SC_K[ZERO],Q_R[OF],J/TRPH0      : SYSTEM INIT
1101: SC_K[.1],Q_R[OF],J/TRPH0        : DATA UNALIGNED
1102: SC_K[.2],Q_R[OF],J/TRPH0        : X PAGE ERROR
1103: SC_K[.3],Q_R[OF],J/TRPH0        : TB MODIFY
1104: SC_K[.4],Q_R[OF],J/TRPH0        : TB PROT ERROR
1105: SC_K[.6],Q_R[OF],J/TRPH0        : TB MISS
1106: SC_K[.9],Q_R[OF],J/TRPH0        : RES FLOAT OPER
1107: SC_K[.7],Q_R[OF],J/TRPH0        : TB PARITY
1108: SC_K[.8],Q_R[OF],J/TRPH0        : CACHE PARITY
110C: SC_K[.C],Q_R[OF],J/TRPH0        : RDS
110D: SC_K[.D],Q_R[OF],J/TRPH0        : TIME OUT
110E: SC_K[.10],Q_R[OF],J/TRPH0       : ODD ADDRESS
110F: SC_K[.F],Q_R[OF],J/TRPH2        : CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC    : WAS TRAP EXPECTED?
      Z?                          : BRANCH IF NO
=0    ALU_Q[AND]MASK,R[OF],ALU,RETURNO : CLEAR THE BIT AND RETURN

```

```

: THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
: IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
: FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

```

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
TRAP CODE--INDICATES WHICH TRAP OCCURRED
FAULT STATUS REGISTER
SBI ERROR REGISTER
TIMEOUT ADDRESS REGISTER
MAINTENANCE REGISTER

```

:1861
:1862
:1863
:1864
:1865
U 1003, 0018,0038,1D80,09E8,0000,1004 :1866
U 1004, 0000,003D,D980,0800,0084,718B :1867
U 1005, 0000,003C,49F0,2C00,0000,100E :1868
U 100E, 0001,203C,4DF0,2D80,0000,104F :1869
U 104F, 0001,203C,65F0,2D88,0000,105B :1870
U 105B, 0001,203C,6DF0,2DD8,0000,105F :1871
U 105F, 0001,203C,75F0,2DE0,0000,1109 :1872
U 1109, 0001,203C,79F0,2DC8,0000,1154 :1873
U 1154, 0001,203C,69F0,2DC0,0000,116A :1874
U 116A, 0001,203C,81F0,2DD0,0000,1000 :1875
U 1000, 0001,203D,0180,09F0,0000,1182 :1876
:1877
:1878
:1879
:1880
:1881
U 116B, 0001,2024,0180,0800,0010,116C :1882
U 116C, 0000,013C,0180,0800,0000,1008 :1883
U 1008, 0001,2036,0180,0AF8,0000,0001 :1884
U 1009, 0000,003C,0180,0800,0000,1003 :1885
:1886
:1887
:1888
:1889
:1890
:1891
:1892
:1893
:1894
:1895
:1896
U 116D, 0000,003C,65F8,0800,0084,716E :1897
U 116E, 0818,0038,8D80,0800,0000,116F :1898
U 116F, 0D00,003C,0180,0800,0000,1170 :1899
U 1170, 0000,003C,3D80,3C00,0000,1171 :1900
U 1171, 0818,0038,0580,0800,0000,1172 :1901
U 1172, 0D00,003C,0180,0800,0000,1173 :1902
U 1173, 0F00,003C,3180,3C00,0000,1174 :1903
U 1174, 0000,003C,5D80,3C00,0000,1175 :1904
U 1175, 0000,003C,3980,3C00,0000,1176 :1905
U 1176, 0000,003C,2980,3C00,0000,1177 :1906
U 1177, 0000,003C,4980,3C00,0000,1178 :1907
U 1178, 0000,003C,7180,3C00,0000,1179 :1908
U 1179, 0818,0038,C180,0800,0000,117A :1909
U 117A, 0000,003C,6580,3C00,0000,117B :1910
U 117B, 0F00,003C,6D80,3C00,0000,117C :1911
U 117C, 0000,003C,6D80,3C00,0000,117D :1912
U 117D, 0000,003C,6580,3C00,0000,117E :1913
U 117E, 0003,003C,0180,09F0,0000,117F :1914
U 117F, 0003,003C,0180,0AF8,0000,1180 :1915

```

```

:
: CACHE PARITY REGISTER
: TB ERROR REGISTER 1
: TB ERROR REGISTER 0
:-

```

```

TRPH1: RC[0D] SC
=0 SETRCF[.9]
Q_ID[TBER0]
RC[6] Q,Q_ID[TBER1]
RC[7] Q,Q_ID[SBI.ERR]
RC[0B] Q,Q_ID[FAULT]
RC[0C] Q,Q_ID[MAINT]
RC[9] Q,Q_ID[PARITY]
RC[8] Q,Q_ID[TIME.ADDR]
RC[0A] Q,Q_ID[USTACK]
1000: RC[0E] Q,ERROR1

```

```

: +
: THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
:-

```

```

TRPH2: ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS THE TRAP EXPECTED?
Z? ; BRANCH IF NO
=0 ALU_Q[AND]MASK,RC[0F]_ALU,RETURN1 ; RETURN
J/TRPH1 ; REPORT UNEXPECTED TRAP

```

```

: +
: THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
: NEWTST
: ERLOOP
: ERROR1
: ERROR2
:

```

```

SCOPE: SC_KC[10],Q_0 ; SETUP TO WRITE IPL OF 1F
D_RC[1F] ; ...
D-DAL.SC
ID[PSL]_D ; WRITE THE PSL
D_KC[1] ; SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES] D,D_0 ; CLEAR THE CES REGISTER
ID[ACC.TS]_D ; SHUT OFF THE FLOATING POINT
ID[SIR] D ; CLEAR THE SIR REGISTER
ID[CLK.TS] D ; STOP INTERVAL TIMER
ID[TBER0] D ; SHUT OFF THE TB
ID[COMP] D ; CLEAR SILO COMPARATOR
D_KC[FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[0E] 0
RC[0F]_D

```

```
U 1180, 0003,003C,0180,09E8,0000,105E :1916
U 1181, 0818,0038,0980,0800,0000,105E :1917
U 1182, 0810,0038,0180,0978,0000,1183 :1918
U 1183, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 1184, 0810,0038,0180,0978,0000,1185 :1922
U 1185, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
:1927
U 105E, 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,1186 :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 1186, 0018,0038,C180,0800,0000,1187 :1966
U 1187, 0118,0038,1B80,0800,0000,1188 :1967
U 1188, 0100,003E,0380,0800,0000,0001 :1968
:1969
:1970

RC[0D] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[0F]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[0F]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE

;+
; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
;-

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

;+
; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
; FOR EXAMPLE: IF A HEX "CC" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
; THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
;
;=0 D 0,CALL,J/DCC
; NOP
;=0 CALL,J/DCC
;-

DCC: ALU_K[.FFFF],J/S00
S00: ALU_0(K),D_D.LEFT2,S1/7,J/SX
SX: D_D.LEFT2,S1/7,RETURN1 ; EXIT
```

```

:1971 :+
:1972 : THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1973 : THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
:1974 : TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1975 : TYPING IT.
:1976 :-
:1977
U 1189, 0810,0038,4D80,0978,0000,118A :1978 SUBST: D RC[OF],KMX/.FF00
U 118A, 0019,4016,4D80,09F8,0000,0001 :1979 RC[OF]_D+K[.FF00],WORD,RETURN1
:1980
:1981 :+
:1982 : THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:1983 : LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:1984 : WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:1985 :-
:1986
U 118B, 0010,0038,01C0,0978,0000,118C :1987 SETRCF: Q_RC[OF]
U 118C, 0019,2034,4DC0,0800,0000,118D :1988 Q-Q.AND.K[.FF00]
U 118D, 0019,2032,1D80,09F8,0000,0001 :1989 RC[OF]_Q.OR.SC,RETURN1
:1990

```


U 1155, 0019,2000,05C0,0800,0000,12AB :1991
:1992
:1993
:1994
:1995
:1996
:1997
:1998
:1999
:2000
:2001
:2002
:2003
:2004
:2005
:2006
:2007
U 118E, 0800,003C,D980,0A50,0084,718F :2008
U 118F, 0001,001C,0180,0AD0,0000,1190 :2009
U 1190, 0818,0038,1180,0800,0000,1191 :2010
U 1191, 0000,003C,01F8,0800,0084,7192 :2011
U 1192, 0D00,003C,0180,0800,0000,1197 :2012
:2013
U 1193, 0F00,003C,01F8,0800,0000,1197 :2014
U 1194, 0818,0038,0980,0800,0000,1195 :2015
U 1195, 0000,003C,01F8,0800,0084,7196 :2016
U 1196, 0D00,003C,0180,0800,0000,1197 :2017
:2018
U 1197, 0019,0030,8580,0AD8,0000,1198 :2019
U 1198, 0800,003C,0180,0A50,0000,1199 :2020
U 1199, 0000,003C,6580,0800,0084,719A :2021
U 119A, 0D00,003C,0180,0A58,0000,119B :2022
U 119B, 081C,2030,0180,0800,0000,105E :2023
:2024
:2025
:2026
:2027
:2028
:2029
:2030
:2031
U 100A, 0018,0039,4580,0AD0,0000,118E :2032
U 100B, 0000,003C,0180,0800,8000,100C :2033
U 100C, 0018,0039,1980,0AD0,0000,118E :2034
U 100D, 0000,003E,0180,0800,0000,0001 :2035
:2036
:2037
:2038
:2039
:2040
:2041
:2042
:2043
:2044
:2045

1155: Q_Q-K[.1],J/12AB

THE FOLLOWING ROUTINES ARE USES TO SET OR CLEAR BITS IN THE CONSOLE
REGISTERS. BYTE 0 OF THE D REGISTER MUST CONTAIN 'C', BYTE ONE OF THE
D REGISTER MUST CONTAIN THE CONSOLE REGISTER ID, I.E. 0=TXCS, 2=RXCS,
AND 4=MCR, AND THE UPPER WORD OF THE D REGISTER MUST CONTAIN THE DATA
TO SET IN THE REGISTER.

THE SUBROUTINES MUST BE CALLED WITH THE DATA TO LOAD INTO THE REGISTER
IN SCRATCH PAD R[0A].

NOTE: ONLY BIT 15, 9 AND 8 OF THE MCR REGISTER CAN BE SET OR CLEARED.
ONLY BIT 7 OF THE RXCS REGISTER CAN BE SET OR CLEARED.
BIT 7 OF THE TXCS REGISTER IS ALWAYS SET WHILE THE MICRO CODE IS RUNNING.

```
SETMCR: D R[0A],SC K[.9]          ; INSERT BIT 9 INTO DATA
        R[0A] D.ORNOT.MASK        ; GET REGISTER ID
        D K[.2]                  ; SETUP FOR SHIFT
        SC K[.8],Q 0              ; SHIFT TO BYTE 1
        D_BAL.SC,J7COMCON

SETTXCS: D 0,J/COMCON,Q 0          ; SET REGISTER ID
SETRXCS: D K[.2]                  ; GET REGISTER ID
        SC K[.8],Q 0              ; SETUP FOR SHIFT
        D_BAL.SC,J7COMCON          ; PUT IN BYTE 1

COMCON: R[0B] D.OR.K[.C]           ; INSERT BYTE 0 AND SAVE
        D R[0A]                   ; GET DATA TO PUT IN CONSOLE REG
        SC K[.10]                  ; SETUP FOR SHIFT
        D_BAL.SC,LAB R[0B]         ; PUT IN UPPER WORD
        D_LA.OR.D,J/CALLCON        ; INSERT LOWER WORD AND CALL CONSOLE
```

THIS SUBROUTINE SETS THE HALT PENDING BIT BY SETTING THE HALT REQUEST
BIT IN THE CONSOLE, EXECUTING AN INTERRUPT ACK, AND THEN CLEARS THE
HALT REQUEST BIT IN THE CONSOLE.

```
=0
SETHP: SETMCR[.8000]              ; SET THE HALT REQUEST BIT
        INTRPT.ACK                ; SET THE HP BIT
=0 SETMCR[ZERO]                   ; CLEAR THE HALT REQUEST BIT
        RETURN1
```

THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
THE INSTRUCTION AT LOCATION 'DISPAT' LOADS THE Q REGISTER WITH HEX 100
AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.

```

:2046
U 119C, 0038,003B,41C0,0800,1000,1200 :2047
:2048
:2049
:2050
:2051
U 1200, 0019,2000,05C0,0800,0000,1201 :2052
U 1201, 0019,2000,05C0,0800,0000,1202 :2053
U 1202, 0019,2000,05C0,0800,0000,1203 :2054
U 1203, 0019,2000,05C0,0800,0000,1204 :2055
U 1204, 0019,2000,05C0,0800,0000,1205 :2056
U 1205, 0019,2000,05C0,0800,0000,1206 :2057
U 1206, 0019,2000,05C0,0800,0000,1207 :2058
U 1207, 0019,2000,05C0,0800,0000,1208 :2059
U 1208, 0019,2000,05C0,0800,0000,1209 :2060
U 1209, 0019,2000,05C0,0800,0000,120A :2061
U 120A, 0019,2000,05C0,0800,0000,120B :2062
U 120B, 0019,2000,05C0,0800,0000,120C :2063
U 120C, 0019,2000,05C0,0800,0000,120D :2064
U 120D, 0019,2000,05C0,0800,0000,120E :2065
U 120E, 0019,2000,05C0,0800,0000,120F :2066
U 120F, 0019,2000,05C0,0800,0000,1210 :2067
U 1210, 0019,2000,05C0,0800,0000,1211 :2068
U 1211, 0019,2000,05C0,0800,0000,1212 :2069
U 1212, 0019,2000,05C0,0800,0000,1213 :2070
U 1213, 0019,2000,05C0,0800,0000,1214 :2071
U 1214, 0019,2000,05C0,0800,0000,1215 :2072
U 1215, 0019,2000,05C0,0800,0000,1216 :2073
U 1216, 0019,2000,05C0,0800,0000,1217 :2074
U 1217, 0019,2000,05C0,0800,0000,1218 :2075
U 1218, 0019,2000,05C0,0800,0000,1219 :2076
U 1219, 0019,2000,05C0,0800,0000,121A :2077
U 121A, 0019,2000,05C0,0800,0000,121B :2078
U 121B, 0019,2000,05C0,0800,0000,121C :2079
U 121C, 0019,2000,05C0,0800,0000,121D :2080
U 121D, 0019,2000,05C0,0800,0000,121E :2081
U 121E, 0019,2000,05C0,0800,0000,121F :2082
U 121F, 0019,2000,05C0,0800,0000,1220 :2083
U 1220, 0019,2000,05C0,0800,0000,1221 :2084
U 1221, 0019,2000,05C0,0800,0000,1222 :2085
U 1222, 0019,2000,05C0,0800,0000,1223 :2086
U 1223, 0019,2000,05C0,0800,0000,1224 :2087
U 1224, 0019,2000,05C0,0800,0000,1225 :2088
U 1225, 0019,2000,05C0,0800,0000,1226 :2089
U 1226, 0019,2000,05C0,0800,0000,1227 :2090
U 1227, 0019,2000,05C0,0800,0000,1228 :2091
U 1228, 0019,2000,05C0,0800,0000,1229 :2092
U 1229, 0019,2000,05C0,0800,0000,122A :2093
U 122A, 0019,2000,05C0,0800,0000,122B :2094
U 122B, 0019,2000,05C0,0800,0000,122C :2095
U 122C, 0019,2000,05C0,0800,0000,122D :2096
U 122D, 0019,2000,05C0,0800,0000,122E :2097
U 122E, 0019,2000,05C0,0800,0000,122F :2098
U 122F, 0019,2000,05C0,0800,0000,1230 :2099
U 1230, 0019,2000,05C0,0800,0000,1231 :2100

```

```

SYNC00:
CALL3: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,MSC/IRD,J/DISPATTBL

```

```

1200:
DISPATTBL:
1200: Q-Q-K[.1]
1201: Q-Q-K[.1]
1202: Q-Q-K[.1]
1203: Q-Q-K[.1]
1204: Q-Q-K[.1]
1205: Q-Q-K[.1]
1206: Q-Q-K[.1]
1207: Q-Q-K[.1]
1208: Q-Q-K[.1]
1209: Q-Q-K[.1]
120A: Q-Q-K[.1]
120B: Q-Q-K[.1]
120C: Q-Q-K[.1]
120D: Q-Q-K[.1]
120E: Q-Q-K[.1]
120F: Q-Q-K[.1]
1210: Q-Q-K[.1]
1211: Q-Q-K[.1]
1212: Q-Q-K[.1]
1213: Q-Q-K[.1]
1214: Q-Q-K[.1]
1215: Q-Q-K[.1]
1216: Q-Q-K[.1]
1217: Q-Q-K[.1]
1218: Q-Q-K[.1]
1219: Q-Q-K[.1]
121A: Q-Q-K[.1]
121B: Q-Q-K[.1]
121C: Q-Q-K[.1]
121D: Q-Q-K[.1]
121E: Q-Q-K[.1]
121F: Q-Q-K[.1]
1220: Q-Q-K[.1]
1221: Q-Q-K[.1]
1222: Q-Q-K[.1]
1223: Q-Q-K[.1]
1224: Q-Q-K[.1]
1225: Q-Q-K[.1]
1226: Q-Q-K[.1]
1227: Q-Q-K[.1]
1228: Q-Q-K[.1]
1229: Q-Q-K[.1]
122A: Q-Q-K[.1]
122B: Q-Q-K[.1]
122C: Q-Q-K[.1]
122D: Q-Q-K[.1]
122E: Q-Q-K[.1]
122F: Q-Q-K[.1]
1230: Q-Q-K[.1]

```

CCCCC

U	1231.	0019.	2000.	05C0.	0800.	0000.	1232	:2101	1231:	Q-Q-K[.1]
U	1232.	0019.	2000.	05C0.	0800.	0000.	1233	:2102	1232:	Q-Q-K[.1]
U	1233.	0019.	2000.	05C0.	0800.	0000.	1234	:2103	1233:	Q-Q-K[.1]
U	1234.	0019.	2000.	05C0.	0800.	0000.	1235	:2104	1234:	Q-Q-K[.1]
U	1235.	0019.	2000.	05C0.	0800.	0000.	1236	:2105	1235:	Q-Q-K[.1]
U	1236.	0019.	2000.	05C0.	0800.	0000.	1237	:2106	1236:	Q-Q-K[.1]
U	1237.	0019.	2000.	05C0.	0800.	0000.	1238	:2107	1237:	Q-Q-K[.1]
U	1238.	0019.	2000.	05C0.	0800.	0000.	1239	:2108	1238:	Q-Q-K[.1]
U	1239.	0019.	2000.	05C0.	0800.	0000.	123A	:2109	1239:	Q-Q-K[.1]
U	123A.	0019.	2000.	05C0.	0800.	0000.	123B	:2110	123A:	Q-Q-K[.1]
U	123B.	0019.	2000.	05C0.	0800.	0000.	123C	:2111	123B:	Q-Q-K[.1]
U	123C.	0019.	2000.	05C0.	0800.	0000.	123D	:2112	123C:	Q-Q-K[.1]
U	123D.	0019.	2000.	05C0.	0800.	0000.	123E	:2113	123D:	Q-Q-K[.1]
U	123E.	0019.	2000.	05C0.	0800.	0000.	123F	:2114	123E:	Q-Q-K[.1]
U	123F.	0019.	2000.	05C0.	0800.	0000.	1240	:2115	123F:	Q-Q-K[.1]
U	1240.	0019.	2000.	05C0.	0800.	0000.	1241	:2116	1240:	Q-Q-K[.1]
U	1241.	0019.	2000.	05C0.	0800.	0000.	1242	:2117	1241:	Q-Q-K[.1]
U	1242.	0019.	2000.	05C0.	0800.	0000.	1243	:2118	1242:	Q-Q-K[.1]
U	1243.	0019.	2000.	05C0.	0800.	0000.	1244	:2119	1243:	Q-Q-K[.1]
U	1244.	0019.	2000.	05C0.	0800.	0000.	1245	:2120	1244:	Q-Q-K[.1]
U	1245.	0019.	2000.	05C0.	0800.	0000.	1246	:2121	1245:	Q-Q-K[.1]
U	1246.	0019.	2000.	05C0.	0800.	0000.	1247	:2122	1246:	Q-Q-K[.1]
U	1247.	0019.	2000.	05C0.	0800.	0000.	1248	:2123	1247:	Q-Q-K[.1]
U	1248.	0019.	2000.	05C0.	0800.	0000.	1249	:2124	1248:	Q-Q-K[.1]
U	1249.	0019.	2000.	05C0.	0800.	0000.	124A	:2125	1249:	Q-Q-K[.1]
U	124A.	0019.	2000.	05C0.	0800.	0000.	124B	:2126	124A:	Q-Q-K[.1]
U	124B.	0019.	2000.	05C0.	0800.	0000.	124C	:2127	124B:	Q-Q-K[.1]
U	124C.	0019.	2000.	05C0.	0800.	0000.	124D	:2128	124C:	Q-Q-K[.1]
U	124D.	0019.	2000.	05C0.	0800.	0000.	124E	:2129	124D:	Q-Q-K[.1]
U	124E.	0019.	2000.	05C0.	0800.	0000.	124F	:2130	124E:	Q-Q-K[.1]
U	124F.	0019.	2000.	05C0.	0800.	0000.	1250	:2131	124F:	Q-Q-K[.1]
U	1250.	0019.	2000.	05C0.	0800.	0000.	1251	:2132	1250:	Q-Q-K[.1]
U	1251.	0019.	2000.	05C0.	0800.	0000.	1252	:2133	1251:	Q-Q-K[.1]
U	1252.	0019.	2000.	05C0.	0800.	0000.	1253	:2134	1252:	Q-Q-K[.1]
U	1253.	0019.	2000.	05C0.	0800.	0000.	1254	:2135	1253:	Q-Q-K[.1]
U	1254.	0019.	2000.	05C0.	0800.	0000.	1255	:2136	1254:	Q-Q-K[.1]
U	1255.	0019.	2000.	05C0.	0800.	0000.	1256	:2137	1255:	Q-Q-K[.1]
U	1256.	0019.	2000.	05C0.	0800.	0000.	1257	:2138	1256:	Q-Q-K[.1]
U	1257.	0019.	2000.	05C0.	0800.	0000.	1258	:2139	1257:	Q-Q-K[.1]
U	1258.	0019.	2000.	05C0.	0800.	0000.	1259			

U	1268.	0019.	2000.	05C0.	0800.	0000.	1269.	:2156	1268:	Q-Q-K[.1]
U	1269.	0019.	2000.	05C0.	0800.	0000.	126A.	:2157	1269:	Q-Q-K[.1]
U	126A.	0019.	2000.	05C0.	0800.	0000.	126B.	:2158	126A:	Q-Q-K[.1]
U	126B.	0019.	2000.	05C0.	0800.	0000.	126C.	:2159	126B:	Q-Q-K[.1]
U	126C.	0019.	2000.	05C0.	0800.	0000.	126D.	:2160	126C:	Q-Q-K[.1]
U	126D.	0019.	2000.	05C0.	0800.	0000.	126E.	:2161	126D:	Q-Q-K[.1]
U	126E.	0019.	2000.	05C0.	0800.	0000.	126F.	:2162	126E:	Q-Q-K[.1]
U	126F.	0019.	2000.	05C0.	0800.	0000.	1270.	:2163	126F:	Q-Q-K[.1]
U	1270.	0019.	2000.	05C0.	0800.	0000.	1271.	:2164	1270:	Q-Q-K[.1]
U	1271.	0019.	2000.	05C0.	0800.	0000.	1272.	:2165	1271:	Q-Q-K[.1]
U	1272.	0019.	2000.	05C0.	0800.	0000.	1273.	:2166	1272:	Q-Q-K[.1]
U	1273.	0019.	2000.	05C0.	0800.	0000.	1274.	:2167	1273:	Q-Q-K[.1]
U	1274.	0019.	2000.	05C0.	0800.	0000.	1275.	:2168	1274:	Q-Q-K[.1]
U	1275.	0019.	2000.	05C0.	0800.	0000.	1276.	:2169	1275:	Q-Q-K[.1]
U	1276.	0019.	2000.	05C0.	0800.	0000.	1277.	:2170	1276:	Q-Q-K[.1]
U	1277.	0019.	2000.	05C0.	0800.	0000.	1278.	:2171	1277:	Q-Q-K[.1]
U	1278.	0019.	2000.	05C0.	0800.	0000.	1279.	:2172	1278:	Q-Q-K[.1]
U	1279.	0019.	2000.	05C0.	0800.	0000.	127A.	:2173	1279:	Q-Q-K[.1]
U	127A.	0019.	2000.	05C0.	0800.	0000.	127B.	:2174	127A:	Q-Q-K[.1]
U	127B.	0019.	2000.	05C0.	0800.	0000.	127C.	:2175	127B:	Q-Q-K[.1]
U	127C.	0019.	2000.	05C0.	0800.	0000.	127D.	:2176	127C:	Q-Q-K[.1]
U	127D.	0019.	2000.	05C0.	0800.	0000.	127E.	:2177	127D:	Q-Q-K[.1]
U	127E.	0019.	2000.	05C0.	0800.	0000.	127F.	:2178	127E:	Q-Q-K[.1]
U	127F.	0019.	2000.	05C0.	0800.	0000.	1280.	:2179	127F:	Q-Q-K[.1]
U	1280.	0019.	2000.	05C0.	0800.	0000.	1281.	:2180	1280:	Q-Q-K[.1]
U	1281.	0019.	2000.	05C0.	0800.	0000.	1282.	:2181	1281:	Q-Q-K[.1]
U	1282.	0019.	2000.	05C0.	0800.	0000.	1283.	:2182	1282:	Q-Q-K[.1]
U	1283.	0019.	2000.	05C0.	0800.	0000.	1284.	:2183	1283:	Q-Q-K[.1]
U	1284.	0019.	2000.	05C0.	0800.	0000.	1285.	:2184	1284:	Q-Q-K[.1]
U	1285.	0019.	2000.	05C0.	0800.	0000.	1286.	:2185	1285:	Q-Q-K[.1]
U	1286.	0019.	2000.	05C0.	0800.	0000.	1287.	:2186	1286:	Q-Q-K[.1]
U	1287.	0019.	2000.	05C0.	0800.	0000.	1288.	:2187	1287:	Q-Q-K[.1]
U	1288.	0019.	2000.	05C0.	0800.	0000.	1289.	:2188	1288:	Q-Q-K[.1]
U	1289.	0019.	2000.	05C0.	0800.	0000.	128A.	:2189	1289:	Q-Q-K[.1]
U	128A.	0019.	2000.	05C0.	0800.	0000.	128B.	:2190	128A:	Q-Q-K[.1]
U	128B.	0019.	2000.	05C0.	0800.	0000.	128C.	:2191	128B:	Q-Q-K[.1]
U	128C.	0019.	2000.	05C0.	0800.	0000.	128D.	:2192	128C:	Q-Q-K[.1]
U	128D.	0019.	2000.	05C0.	0800.	0000.	128E.	:2193	128D:	Q-Q-K[.1]
U	128E.	0019.	2000.	05C0.	0800.	0000.	128F.	:2194	128E:	Q-Q-K[.1]
U	128F.	0019.	2000.	05C0.	0800.	0000.	1290.			

U 129F.	0019,2000,05C0,0800,0000,12A0	:2211	129F:	Q-Q-K[.1]
U 12A0.	0019,2000,05C0,0800,0000,12A1	:2212	12A0:	Q-Q-K[.1]
U 12A1.	0019,2000,05C0,0800,0000,12A2	:2213	12A1:	Q-Q-K[.1]
U 12A2.	0019,2000,05C0,0800,0000,12A3	:2214	12A2:	Q-Q-K[.1]
U 12A3.	0019,2000,05C0,0800,0000,12A4	:2215	12A3:	Q-Q-K[.1]
U 12A4.	0019,2000,05C0,0800,0000,12A5	:2216	12A4:	Q-Q-K[.1]
U 12A5.	0019,2000,05C0,0800,0000,12A6	:2217	12A5:	Q-Q-K[.1]
U 12A6.	0019,2000,05C0,0800,0000,12A7	:2218	12A6:	Q-Q-K[.1]
U 12A7.	0019,2000,05C0,0800,0000,12A8	:2219	12A7:	Q-Q-K[.1]
U 12A8.	0019,2000,05C0,0800,0000,12A9	:2220	12A8:	Q-Q-K[.1]
U 12A9.	0019,2000,05C0,0800,0000,12AA	:2221	12A9:	Q-Q-K[.1]
U 12AA.	0019,2000,05C0,0800,0000,12AB	:2222	12AA:	Q-Q-K[.1]
U 12AB.	0019,2000,05C0,0800,0000,12AC	:2223	12AB:	Q-Q-K[.1]
U 12AC.	0019,2000,05C0,0800,0000,12AD	:2224	12AC:	Q-Q-K[.1]
U 12AD.	0019,2000,05C0,0800,0000,12AE	:2225	12AD:	Q-Q-K[.1]
U 12AE.	0019,2000,05C0,0800,0000,12AF	:2226	12AE:	Q-Q-K[.1]
U 12AF.	0019,2000,05C0,0800,0000,12B0	:2227	12AF:	Q-Q-K[.1]
U 12B0.	0019,2000,05C0,0800,0000,12B1	:2228	12B0:	Q-Q-K[.1]
U 12B1.	0019,2000,05C0,0800,0000,12B2	:2229	12B1:	Q-Q-K[.1]
U 12B2.	0019,2000,05C0,0800,0000,12B3	:2230	12B2:	Q-Q-K[.1]
U 12B3.	0019,2000,05C0,0800,0000,12B4	:2231	12B3:	Q-Q-K[.1]
U 12B4.	0019,2000,05C0,0800,0000,12B5	:2232	12B4:	Q-Q-K[.1]
U 12B5.	0019,2000,05C0,0800,0000,12B6	:2233	12B5:	Q-Q-K[.1]
U 12B6.	0019,2000,05C0,0800,0000,12B7	:2234	12B6:	Q-Q-K[.1]
U 12B7.	0019,2000,05C0,0800,0000,12B8	:2235	12B7:	Q-Q-K[.1]
U 12B8.	0019,2000,05C0,0800,0000,12B9	:2236	12B8:	Q-Q-K[.1]
U 12B9.	0019,2000,05C0,0800,0000,12BA	:2237	12B9:	Q-Q-K[.1]
U 12BA.	0019,2000,05C0,0800,0000,12BB	:2238	12BA:	Q-Q-K[.1]
U 12BB.	0019,2000,05C0,0800,0000,12BC	:2239	12BB:	Q-Q-K[.1]
U 12BC.	0019,2000,05C0,0800,0000,12BD	:2240	12BC:	Q-Q-K[.1]
U 12BD.	0019,2000,05C0,0800,0000,12BE	:2241	12BD:	Q-Q-K[.1]
U 12BE.	0019,2000,05C0,0800,0000,12BF	:2242	12BE:	Q-Q-K[.1]
U 12BF.	0019,2000,05C0,0800,0000,12C0	:2243	12BF:	Q-Q-K[.1]
U 12C0.	0019,2000,05C0,0800,0000,12C1	:2244	12C0:	Q-Q-K[.1]
U 12C1.	0019,2000,05C0,0800,0000,12C2	:2245	12C1:	Q-Q-K[.1]
U 12C2.	0019,2000,05C0,0800,0000,12C3	:2246	12C2:	Q-Q-K[.1]
U 12C3.	0019,2000,05C0,0800,0000,12C4	:2247	12C3:	Q-Q-K[.1]
U 12C4.	0019,2000,05C0,0800,0000,12C5	:2248	12C4:	Q-Q-K[.1]
U 12C5.	0019,2000,05C0,0800,0000,12C6	:2249	12C5:	Q-Q-K[.1]
U 12C6.	0019,2000,05C0,0800,0000,12C7	:2250	12C6:	Q-Q-K[.1]
U 12C7.	0019,2000,05C0,0800,0000,12C8	:2251	12C7:	Q-Q-K[.1]
U 12C8.	0019,2000,05C0,0800,0000,12C9	:2252	12C8:	Q-Q-K[.1]
U 12C9.	0019,2000,05C0,0800,0000,12CA	:2253	12C9:	Q-Q-K[.1]
U 12CA.	0019,2000,05C0,0800,0000,12CB	:2254	12CA:	Q-Q-K[.1]
U 12CB.	0019,2000,05C0,0800,0000,12CC	:2255	12CB:	Q-Q-K[.1]
U 12CC.	0019,2000,05C0,0800,0000,12CD	:2256	12CC:	Q-Q-K[.1]
U 12CD.	0019,2000,05C0,0800,0000,12CE	:2257	12CD:	Q-Q-K[.1]
U 12CE.	0019,2000,05C0,0800,0000,12CF	:2258	12CE:	Q-Q-K[.1]
U 12CF.	0019,2000,05C0,0800,0000,12D0	:2259	12CF:	Q-Q-K[.1]
U 12D0.	0019,2000,05C0,0800,0000,12D1	:2260	12D0:	Q-Q-K[.1]
U 12D1.	0019,2000,05C0,0800,0000,12D2	:2261	12D1:	Q-Q-K[.1]
U 12D2.	0019,2000,05C0,0800,0000,12D3	:2262	12D2:	Q-Q-K[.1]
U 12D3.	0019,2000,05C0,080			

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U 12D6, 0019,2000,05C0,0800,0000,12D7 :2266
U 12D7, 0019,2000,05C0,0800,0000,12D8 :2267
U 12D8, 0019,2000,05C0,0800,0000,12D9 :2268
U 12D9, 0019,2000,05C0,0800,0000,12DA :2269
U 12DA, 0019,2000,05C0,0800,0000,12DB :2270
U 12DB, 0019,2000,05C0,0800,0000,12DC :2271
U 12DC, 0019,2000,05C0,0800,0000,12DD :2272
U 12DD, 0019,2000,05C0,0800,0000,12DE :2273
U 12DE, 0019,2000,05C0,0800,0000,12DF :2274
U 12DF, 0019,2000,05C0,0800,0000,12E0 :2275
U 12E0, 0019,2000,05C0,0800,0000,12E1 :2276
U 12E1, 0019,2000,05C0,0800,0000,12E2 :2277
U 12E2, 0019,2000,05C0,0800,0000,12E3 :2278
U 12E3, 0019,2000,05C0,0800,0000,12E4 :2279
U 12E4, 0019,2000,05C0,0800,0000,12E5 :2280
U 12E5, 0019,2000,05C0,0800,0000,12E6 :2281
U 12E6, 0019,2000,05C0,0800,0000,12E7 :2282
U 12E7, 0019,2000,05C0,0800,0000,12E8 :2283
U 12E8, 0019,2000,05C0,0800,0000,12E9 :2284
U 12E9, 0019,2000,05C0,0800,0000,12EA :2285
U 12EA, 0019,2000,05C0,0800,0000,12EB :2286
U 12EB, 0019,2000,05C0,0800,0000,12EC :2287
U 12EC, 0019,2000,05C0,0800,0000,12ED :2288
U 12ED, 0019,2000,05C0,0800,0000,12EE :2289
U 12EE, 0019,2000,05C0,0800,0000,12EF :2290
U 12EF, 0019,2000,05C0,0800,0000,12F0 :2291
U 12F0, 0019,2000,05C0,0800,0000,12F1 :2292
U 12F1, 0019,2000,05C0,0800,0000,12F2 :2293
U 12F2, 0019,2000,05C0,0800,0000,12F3 :2294
U 12F3, 0019,2000,05C0,0800,0000,12F4 :2295
U 12F4, 0019,2000,05C0,0800,0000,12F5 :2296
U 12F5, 0019,2000,05C0,0800,0000,12F6 :2297
U 12F6, 0019,2000,05C0,0800,0000,12F7 :2298
U 12F7, 0019,2000,05C0,0800,0000,12F8 :2299
U 12F8, 0019,2000,05C0,0800,0000,12F9 :2300
U 12F9, 0019,2000,05C0,0800,0000,12FA :2301
U 12FA, 0019,2000,05C0,0800,0000,12FB :2302
U 12FB, 0019,2000,05C0,0800,0000,12FC :2303
U 12FC, 0019,2000,05C0,0800,0000,12FD :2304
U 12FD, 0019,2000,05C0,0800,0000,12FE :2305
U 12FE, 0019,2000,05C0,0800,0000,12FF :2306
U 12FF, 0019,2002,05C0,0800,0000,0001 :2307
:2308
:2309
:2310
:2311
:2312
:2313
:2314
:2315
:2316
:2317
U 119D, 3000,003C,0180,6000,0000,119E :2318
U 119E, 0000,003C,0180,F800,0000,119F :2319
U 119F, 0000,003C,0180,F800,0000,11A0 :2320

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12D6: Q-Q-K[.1]
12D7: Q-Q-K[.1]
12D8: Q-Q-K[.1]
12D9: Q-Q-K[.1]
12DA: Q-Q-K[.1]
12DB: Q-Q-K[.1]
12DC: Q-Q-K[.1]
12DD: Q-Q-K[.1]
12DE: Q-Q-K[.1]
12DF: Q-Q-K[.1]
12E0: Q-Q-K[.1]
12E1: Q-Q-K[.1]
12E2: Q-Q-K[.1]
12E3: Q-Q-K[.1]
12E4: Q-Q-K[.1]
12E5: Q-Q-K[.1]
12E6: Q-Q-K[.1]
12E7: Q-Q-K[.1]
12E8: Q-Q-K[.1]
12E9: Q-Q-K[.1]
12EA: Q-Q-K[.1]
12EB: Q-Q-K[.1]
12EC: Q-Q-K[.1]
12ED: Q-Q-K[.1]
12EE: Q-Q-K[.1]
12EF: Q-Q-K[.1]
12F0: Q-Q-K[.1]
12F1: Q-Q-K[.1]
12F2: Q-Q-K[.1]
12F3: Q-Q-K[.1]
12F4: Q-Q-K[.1]
12F5: Q-Q-K[.1]
12F6: Q-Q-K[.1]
12F7: Q-Q-K[.1]
12F8: Q-Q-K[.1]
12F9: Q-Q-K[.1]
12FA: Q-Q-K[.1]
12FB: Q-Q-K[.1]
12FC: Q-Q-K[.1]
12FD: Q-Q-K[.1]
12FE: Q-Q-K[.1]
12FF: Q-Q-K[.1],RETURN1

```

```

: +
: THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
: CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
: IS COMPLETELY FULL OF DATA.

```

```

: BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
: -

```

```

IBWAIT: LOAD.IB,IBC/START
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ

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U 11A0, 0000,003C,0180,F800,0000,11A1 :2321
U 11A1, 0000,003C,0180,F800,0000,11A2 :2322
U 11A2, 0000,003C,0180,F800,0000,11A3 :2323
U 11A3, 1000,003E,0180,F800,0000,0001 :2324
 :2325
 :2326
 :2327
 :2328
 :2329
 :2330
U 11A4, 0F00,003C,0180,0800,0000,11A5 :2331
U 11A5, 0000,003C,7580,3C00,0000,11A6 :2332
U 11A6, 0F00,003C,0180,8000,0000,11A7 :2333
U 11A7, 0019,0020,6180,8000,0010,11A8 :2334
U 11A8, 0000,013C,0180,8000,0000,1018 :2335
U 1018, 0819,0014,0580,8000,0000,11A7 :2336
 :2337
U 1019, 0F00,003C,0180,8800,0000,11A9 :2338
U 11A9, 0019,0020,6180,8800,0010,11AA :2339
U 11AA, 0000,013C,0180,8800,0000,101A :2340
U 101A, 0819,0014,0580,8800,0000,11A9 :2341
 :2342
U 101B, 0F00,003C,0180,8000,8000,11AB :2343
U 11AB, 0019,0020,6180,8000,0010,11AC :2344
U 11AC, 0000,013C,0180,8000,0000,101C :2345
U 101C, 0819,0014,0580,8000,0000,11AB :2346
 :2347
U 101D, 0000,003C,8580,0800,0084,71AD :2348
U 11AD, 0803,001C,0180,0800,4000,11AE :2349
U 11AE, 0000,003E,7580,3C00,0000,0001 :2350
 :2351
 :2352

MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ
MCT/ALLOW.IB.READ,IBC/STOP,RETURN1

;;+
;; THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE
;;-

UNJAM: D 0
 ID[MAINT] D ; RELOAD THE MAT REG
 D 0,MCT/SBI.HOLD ; ASSERT HOLD FOR 16 CYCLES
UNJAM0: A[U D[XOR]K[F],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
 Z?,MCT/SBI.HOLD ; BRANCH IF YES
 =0 D_D+K[.1],MCT/SBI.HOLD,J/UNJAM0 ; CONTINUE HOLDING THE BUS

 D 0,MCT/SBI.HOLD+UNJAM ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
UNJAM1: A[U D[XOR]K[F],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
 Z?,MCT/SBI.HOLD+UNJAM ; BRANCH IF YES
 =0 D_D+K[.1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM

 D 0,MCT/SBI.HOLD,INTRPT.ACK ; ASSERT HOLD FOR 16 CYCLES
UNJAM2: A[U D[XOR]K[F],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
 Z?,MCT/SBI.HOLD ; BRANCH IF YES
 =0 D_D+K[.1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING

 SC K[C]
 D NOT.MASK,INTRPT.STROBE
 ID[MAINT]_D,RETURN1 ; TURN OFF THE SBI

:2353
:2354
:2355
:2356
:2357
:2358
:2359
:2360
:2361
:2362
:2363
:2364
:2365
:2366
:2367
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:2399
:2400
:2401
:2402
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:2405
:2406
:2407

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PAGE  'TEST 161      INTERVAL COUNTER'
*****
++
TEST  161      INTERVAL COUNTER

TEST DESCRIPTION
THIS TEST CHECKS THE DATA INTEGRITY AND THE FUNCTIONALITY OF THE
INTERVAL COUNTER.

SUBTST 1 - FLOAT A ZERO THRU THE NEXT INTERVAL REGISTER, LOAD THE
            INTERVAL REGISTER USING THE "TRANSFER" BIT IN THE CONTROL
            AND STATUS REGISTER, AND READ AND CHECK THE INTERVAL REGISTER.
SUBTST 2 - SAME AS SUBTST 1 EXCEPT WITH A FLOATING 1 TEST PATTERN.
SUBTST 3 - CHECK THAT THE CARRY PROPAGATION ON THE INTERVAL REGISTER
            WORKS BY LOADING THE INTERVAL REGISTER WITH ALL ONES,
            STEPPING THE COUNTER, WITH THE SINGLE STEP BIT, AND
            CHECKING THAT THE INTERVAL REGISTER ROLLED OVER TO ZERO.
SUBTST 4 - CHECK THAT THE INTERRUPT ENABLE BIT IN THE CONTROL AND
            STATUS REGISTER CAN BE SET AND CLEARED.
SUBTST 5 - CHECK THE DIVIDE BY 5 COUNTER THAT CONTROLS THE INCREMENT
            OF THE INTERVAL REGISTER AND THE RUN BIT IN THE CONTROL
            AND STATUS REGISTER BY LOADING THE INTERVAL REGISTER
            WITH ZERO, STARTING THE COUNTER, WAITING 8 CYCLES FOR THE
            COUNTER TO INCREMENT TWICE, STOPPING THE COUNTER, AND
            CHECKING THAT THE INTERVAL REGISTER INCREMENTED TWICE
            AND THAT THE RUN BIT SET AND CLEARED.
SUBTST 6 - CHECK THE AUTO RELOAD FUNCTION AND THE INTERRUPT REQUEST
            BIT BY LOADING THE INTERVAL REGISTER WITH ALL ONES,
            LOADING THE NEXT INTERVAL REGISTER WITH 3F, STARTING THE
            COUNTER AND WAITING 3 CYCLES, STOPPING THE COUNTER AND
            CHECKING THE INTERVAL REGISTER FOR 3F AND THE INTERRUPT
            REQUEST BIT SHOULD BE SET. THEN THE INTERRUPT REQUEST BIT
            IS WRITTEN AS A ONE TO ENSURE IT CLEARS.
SUBTST 7 - CHECK THAT THE ERROR BIT SETS AND CLEARS CORRECTLY BY
            LOADING THE INTERVAL REGISTER WITH -2, STARTING THE COUNTER
            AND WAITING 17 CYCLES FOR RELOAD TO OCCUR TWICE,
            STOPPING THE COUNTER AND CHECKING THAT THE ERROR BIT SET.
            THE ERROR BIT IS THEN WRITTEN AS A ONE TO ENSURE IT CLEARS.

LOGIC DESCRIPTION
THIS TEST CHECKS THE INTERVAL COUNTER LOGIC ON THE CEH AND ICL
MODULES. IT ALSO CHECKS THE ID BUS INTERFACE TO THE NEXT INTERVAL
AND INTERVAL REGISTERS.

ERROR DESCRIPTION
DATA: EXPECTED REGISTER CONTENTS (THE REGISTER DEPENDS ON THE SUBTEST)
      RECEIVED REGISTER CONTENTS
      LOOP COUNT -- SUBTESTS 1, 2, AND 4 ONLY.
      INDICATES THE DATA PATTERN BEING LOADED INTO THE INTERVAL COUNTER.

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC26--NEXT INTERVAL REGISTER GETS LOADED
          SYNC27--INTERVAL REGISTER GETS LOADED
          SYNC28--INTERVAL REGISTER IS READ ON THE ID BUS
SUBTST 2 - SYNC29--NEXT INTERVAL REGISTER GETS LOADED

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:2408
:2409
:2410
:2411
:2412
:2413
:2414
:2415
:2416
:2417
:2418
:2419
:2420
:2421
:2422
U 1020, 0018,0039,0D80,09F8,0000,116D :2423
:2424
:2425
:2426
:2427
:2428
:2429
:2430
U 1021, 0818,0038,F180,0800,0000,11AF :2431
U 11AF, 081A,4014,0980,0800,0000,11B0 :2432
U 11B0, 0001,003C,0180,09F0,0000,1022 :2433
U 1022, 0000,003D,0180,0800,0000,11B9 :2434
U 1023, 0018,0038,7580,09E0,0000,1024 :2435
U 1024, 0000,003D,0180,0800,0000,11B1 :2436
U 1025, 0810,0038,0180,0970,0000,11B1 :2437
U 11B1, 0000,003C,2580,3C00,0000,11B2 :2438
U 11B2, 0818,0038,6580,0800,0000,11B3 :2439
U 11B3, 0000,003C,2980,3C00,0000,11B4 :2440
U 11B4, 0810,0038,2DF0,2D70,0000,11B5 :2441
U 11B5, 001D,2000,0180,0800,0010,11B6 :2442
U 11B6, 0000,013C,0180,0800,0000,1028 :2443
U 1028, 0001,203D,0180,09E8,0000,11B4 :2444
U 1029, 0010,0038,01C0,0970,0000,11B7 :2445
U 11B7, 0000,003C,03A8,0800,0000,11B8 :2446
U 11B8, 0001,203C,0180,09F0,0000,11B9 :2447
U 11B9, 0810,0038,0180,0960,0000,11BA :2448
U 11BA, 0019,8000,0580,09E0,0010,11BB :2449
U 11BB, 0000,013C,0180,0800,0000,102A :2450
U 102A, 0000,003C,0180,0800,0000,1025 :2451
:2452
:2453
:2454
:2455
:2456
:2457
:2458
U 102B, 0018,0038,0580,09F0,0000,102C :2459
U 102C, 0000,003D,0180,0800,0000,11B9 :2460
U 102D, 0018,0038,7580,09E0,0000,1030 :2461
U 1030, 0000,003D,0180,0800,0000,11B1 :2462

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:
:
SUBTST 3 - SYNC2A--INTERVAL REGISTER GETS LOADED
SUBTST 4 - SYNC2B--INTERVAL REGISTER IS READ ON THE ID BUS
:
SUBTST 5 - SYNC2C--INTERVAL REGISTER IS Clocked WITH SINGLE CLOCK BIT
:
SUBTST 6 - SYNC2D--INTERRUPT ENABLE BIT GETS LOADED
SUBTST 7 - SYNC2E--INTERRUPT ENABLE BIT GETS READ ON THE ID BUS
:
SUBTST 8 - SYNC31--RUN BIT SETS IN THE CONTROL AND STATUS REGISTER
:
SUBTST 9 - SYNC32--INTERVAL REGISTER CLOCKS THE FIRST TIME
SUBTST 10 - SYNC33--INTERVAL REGISTER CLOCKS THE SECOND TIME
:
SUBTST 11 - SYNC34--RUN BIT IS CLEARED IN THE CONTROL AND STATUS REG
SUBTST 12 - SYNC35--INTERVAL REGISTER RELOADS FROM THE NEXT INT REG
SUBTST 13 - SYNC36--ERROR BIT SETS IN THE CONTROL AND STATUS REG
SUBTST 14 - SYNC37--ERROR BIT CLEARS
:
:
:*****
:
T161: NEWTST[.3]
:
:////////////////////
:
: *
: NOW FLOAT A ZERO THRU THE NEXT INTERVAL AND INTERVAL COUNTER REGISTERS
:
:
T161S1: D_K[.FFFFC] : GENERATE INITIAL PATTERN
: D_D.SXT[WORD]+K[.2] : GENERATE INITIAL PATTERN
: RC[OE]_D
:
=0 SUBTEST
: RC[OC]_K[.20] : SET THE LOOP COUNT
:
=0 ERLOOP
:
T161L2: D RC[OE] : GET THE TEST PATTERN
: SYNC26: ID[NXT.PER]_D : WRITE THE NEXT INTERVAL REG
: D_K[.10]
:
SYNC27: ID[CLK.CS]_D : LOAD THE INTERVAL COUNTER
: SYNC28: Q_ID[INTERVAL],D_RC[OE] : READ THE INTERVAL COUNTER
: A[U_Q-D,CLK.UBCC] : CHECK
: Z?
:
=0 ERROR2,RC[OD]_Q : BIT STUCK IN INTERVAL COUNTER REG
: Q_RC[OE] : GENERATE THE NEXT PATTERN
: Q-Q.LEFT,SI/MUL-
:
RC[OE]_Q : SAVE
: D_RC[OC]
:
RC[OC]_D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
: Z?
:
=0 J/T161L2 : CONTINUE
:
:////////////////////
:
: *
: FLOAT A ONE THRU THE NEXT INTERVAL AND INTERVAL REGISTERS
:
:
T161S2: RC[OE]_K[.1] : INITIALIZE THE TEST PATTERN
:
=0 SUBTEST
:
RC[OC]_K[.20] : SET THE LOOP COUNT
:
=0 ERLOOP

```

U 1031, 0810,0038,0180,0970,0000,11BC :2463
U 11BC, 0000,003C,2580,3C00,0000,11BD :2464
U 11BD, 0818,0038,6580,0800,0000,11BE :2465
U 11BE, 0000,003C,2980,3C00,0000,11BF :2466
U 11BF, 0810,0038,2DF0,2D70,0000,11C0 :2467
U 11C0, 0010,2000,0180,0800,0010,11C1 :2468
U 11C1, 0000,013C,0180,0800,0000,1032 :2469
U 1032, 0001,203D,0180,09E8,0000,1184 :2470
U 1033, 0810,0038,0180,0970,0000,11C2 :2471
U 11C2, 0500,003C,0180,0800,0000,11C3 :2472
U 11C3, 0001,003C,0180,09F0,0000,11C4 :2473
U 11C4, 0810,0038,0180,0960,0000,11C5 :2474
U 11C5, 0019,8000,0580,09E0,0010,11C6 :2475
U 11C6, 0000,013C,0180,0800,0000,1034 :2476
U 1034, 0000,003C,0180,0800,0000,1031 :2477
:2478
:2479
:2480
:2481
:2482
:2483
:2484
:2485
:2486
U 1035, 001B,0000,0580,0A88,0000,1038 :2487
U 1038, 0000,003D,0180,0800,0000,1189 :2488
U 1039, 0F03,003C,0180,09F0,0000,103A :2489
U 103A, 0000,003D,0980,0800,0084,718B :2490
U 103B, 0000,003C,2580,3C00,0000,11C7 :2491
U 11C7, 0818,0038,6580,0800,0000,11C8 :2492
U 11C8, 0000,003C,2980,3C00,0000,11C9 :2493
U 11C9, 0818,0038,0580,0800,0000,11CA :2494
U 11CA, 0000,003C,2980,3C00,0000,11CB :2495
:2496
:2497
:2498
:2499
U 11CB, 0000,003C,0180,0800,0000,11CC :2500
U 11CC, 0000,003C,0180,0800,0000,11CD :2501
U 11CD, 0000,003C,0180,0800,0000,11CE :2502
U 11CE, 0000,003C,0180,0800,0000,11CF :2503
U 11CF, 0F00,003C,0120,0800,0000,11D0 :2504
U 11D0, 0000,003C,2980,3C00,0000,11D1 :2505
:2506
:2507
U 11D1, 081B,0000,0580,0800,0000,11D2 :2508
U 11D2, 0000,003C,2580,3C00,0000,103C :2509
U 103C, 0000,003D,0180,0800,0000,1181 :2510
U 103D, 0018,0038,75C0,0800,0000,11D3 :2511
U 11D3, 0818,0038,6580,0800,0000,11D4 :2512
U 11D4, 0C00,003C,2980,3C00,0000,11D5 :2513
U 11D5, 0000,003C,2980,3C00,0000,11D6 :2514
U 11D6, 0F00,003C,2DF0,2C00,0000,11D7 :2515
U 11D7, 001D,2000,0180,0800,0010,11D8 :2516
U 11D8, 0000,013C,0180,0800,0000,103E :2517

```
T161L1: D RC[OE]          ; GET THE TEST PATTERN
SYNC29: ID[NXT.PER]_D      ; WRITE NEXT INTERVAL REG
          D K[.10]
SYNC2A: ID[CLK.CS]_D       ; LOAD THE INTERVAL COUNTER REG
SYNC2B: Q_ID[INTERVAL],D-RC[OE] ; READ THE REGISTER
          ACU_Q-D,CLK.UBCC   ; CHECK
          Z?
=0      ERROR2,RC[OD]_Q     ; BIT STUCK IN INTERVAL COUNTER REG
          D-RC[OE]          ; GENERATE NEXT PATTERN
          D-D.LEFT
          RC[OE]_D          ; ...
          D-RC[OE]          ; ...
          RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
          Z?
=0      J/T161L1           ; CONTINUE

;////////////////////////////////////

;+
; NOW CHECK THAT THE CARRYS ON THE INTERVAL COUNTER ARE OK AND THAT THE
; SINGLE STEP FUNCTION WORKS
;-

T161S3: RC[1]_0-K[.1]      ; GENERATE A MINUS ONE
=0      SUBTEST
          RC[OE]_0,D_0      ; SET THE EXPECTED VALUE
=0      SETRCF[.2]
          ID[NXT.PER]_D     ; SET NEXT INTERVAL REG TO 0
          D K[.10]
          ID[CLK.CS]_D      ; LOAD INTERVAL REG
          D K[.1]           ; SATRT THE CLOCK
          ID[CLK.CS]_D
;+
; WAIT FOR THE RELOAD FLIP FLOP TO CLEAR
;-

          NOP
          NOP
          NOP
          NOP
          D_0
          ID[CLK.CS]_D      ; STOP THE CLOCK

;
          D_0-K[.1]
          ID[NXT.PER]_D     ; LOAD THE MINUS ONE INTO NEXT INTERVAL
=0      ERLOOP
          Q_K[.20]
          D-K[.10]
          ID[CLK.CS]_D,D_0  ; LOAD THE MINUS ONE INTO INTERVAL CNTR
          ID[CLK.CS]_D      ; STEP THE COUNTER
          Q_ID[INTERVAL],D_0 ; READ THE INTERVAL REG
          ACU_Q-D,CLK.UBCC   ; CHECK THAT IT WENT TO ZERO
          Z?
```

```

U 103E, 0001,203D,0180,09E8,0000,1184 :2518
:2519
:2520
:2521
:2522
:2523
:2524
:2525
:2526
U 103F, 0018,0038,0980,09E0,0000,1040 :2527
U 1040, 0000,003D,0180,0800,0000,1189 :2528
U 1041, 0000,003C,0180,0800,0000,1042 :2529
U 1042, 0000,003D,0D80,0800,0084,718B :2530
U 1043, 0018,0038,3180,09F0,0000,1044 :2531
U 1044, 0000,003D,0180,0800,0000,1181 :2532
U 1045, 0810,0038,0180,0970,0000,11D9 :2533
U 11D9, 0000,003C,2980,3C00,0000,11DA :2534
U 11DA, 0810,0038,29F0,2D70,0000,11DB :2535
U 11DB, 0019,2034,31C0,0800,0000,11DC :2536
U 11DC, 001D,2000,0180,0800,0010,11DD :2537
U 11DD, 0000,013C,0180,0800,0000,1046 :2538
U 1046, 0001,203D,0180,09E8,0000,1184 :2539
U 1047, 0003,003C,0180,09F0,0000,11DE :2540
U 11DE, 0810,0038,0180,0960,0000,11DF :2541
U 11DF, 0019,8000,0580,09E0,0010,11E0 :2542
U 11E0, 0000,013C,0180,0800,0000,1048 :2543
U 1048, 0000,003C,0180,0800,0000,1045 :2544
:2545
:2546
:2547
:2548
:2549
:2550
:2551
:2552
:2553
U 1049, 0018,0038,0580,09F0,0000,104A :2554
U 104A, 0000,003D,0180,0800,0000,1189 :2555
U 104B, 0000,003C,0180,0800,0000,104C :2556
U 104C, 0000,003D,0980,0800,0084,718B :2557
U 104D, 0F00,003C,0180,0800,0000,11E1 :2558
U 11E1, 0000,003C,2580,3C00,0000,1050 :2559
U 1050, 0000,003D,0180,0800,0000,1181 :2560
U 1051, 0818,0038,6580,0800,0000,11E2 :2561
U 11E2, 0000,003C,2980,3C00,0000,11E3 :2562
U 11E3, 0818,0038,0580,0800,0000,11E4 :2563
U 11E4, 0000,003C,2980,3C00,0000,11E5 :2564
:2565
:2566
:2567
:2568
:2569
:2570
:2571
U 11E5, 0000,003C,29F0,2C00,0000,11E6 :2572

```

```

=0      ERROR2,RC[0D]_0      ; INTERVAL COUNTER DID NOT GO TO ZERO

```

```

;////////////////////////////////////

```

```

;+
; CHECK THE INTERRUPT ENABLE BIT IN THE CONTROL AND STATUS REGISTER
;-

```

```

T161S4: RC[0C]_K[.2]      ; SET THE LOOP COUNT

```

```

=0      SUBTEST
      NOP

```

```

=0      SETRCF[.3]
      RC[0E]_K[.40]      ; SET THE EXPECTED DATA

```

```

=0      ERLOOP

```

```

T161L3: D RC[0E]      ; GET THE TEST PATTERN

```

```

SYNC2D: ID[CLK.CS]_D      ; WRITE THE IE BIT

```

```

SYNC2E: Q_ID[CLK.CS]_D_RC[0E]      ; READ IT BACK

```

```

      Q_Q.AND.K[.40]      ; MASK

```

```

      A[U_Q-D,CLK.UBCC]      ; CHECK

```

```

      Z?

```

```

=0      ERROR2,RC[0D]_0      ; IE BIT FAILED

```

```

      RC[0E]_0

```

```

      D RC[0C]

```

```

      RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; CHECK THE LOOP COUNT

```

```

      Z?

```

```

=0      J/T161L3      ; CONTINUE

```

```

;////////////////////////////////////

```

```

;+
; NOW CHECK THE DIVIDE BY 5 COUNTER THAT GENERATES THE CLOCK PULSES TO THE
; INTERVAL COUNTER
;-

```

```

T161S5: RC[0E]_K[.1]      ; SET THE EXPECTED DATA FOR THE RUN BIT

```

```

=0      SUBTEST
      NOP

```

```

=0      SETRCF[.2]
      D 0

```

```

      ID[NXT.PER]_D      ; INIT THE NEXT INTERVAL REGISTER

```

```

=0      ERLOOP

```

```

      D K[.10]

```

```

      ID[CLK.CS]_D      ; LOAD THE INTERVAL COUNTER

```

```

      D K[.1]

```

```

SYNC31: ID[CLK.CS]_D      ; START THE COUNTER

```

```

;////////////////////////////////////

```

```

;+
; MUST WAIT 8 CYCLES FOR THE COUNTER TO TICK TWICE
;-

```

```

      Q_ID[CLK.CS]      ; READ THE RUN BIT

```



```

U 11E6, 0000,003C,0180,0800,0000,11E7 :2573      NOP
U 11E7, 0000,003C,0180,0800,0000,11E8 :2574      NOP
U 11E8, 0000,003C,0180,0800,0000,11E9 :2575      SYNC32: NOP
U 11E9, 0000,003C,0180,0800,0000,11EA :2576      NOP
U 11EA, 0000,003C,0180,0800,0000,11EB :2577      NOP
U 11EB, 0000,003C,0180,0800,0000,11EC :2578      NOP
U 11EC, 0F00,003C,0180,0800,0000,11ED :2579      D_0
:2580
:2581      SYNC34:
:2582      SYNC33: ID[CLK.CS]_D,D_RC[OE]      : STOP THE CLOCK
U 11ED, 0810,0038,2980,3D70,0000,11EE :2583      Q_Q.AND.K[.1]      : MASK THE RECEIVED RUN BIT
U 11EE, 0019,2034,05C0,0800,0000,11EF :2584      A[U_Q-D,CLK.UBCC      : CHECK THE RUN BIT
U 11EF, 001D,2000,0180,0800,0010,11F0 :2585      Z?
U 11F0, 0000,013C,0180,0800,0000,1052 :2586      =0      ERROR2,RC[OD]_Q      : RUN BIT DID NOT SET
U 1052, 0001,203D,0180,09E8,0000,1184 :2587      RC[OE]_0,D_0      : SET EXPECTED DATA FOR RUN BIT
U 1053, 0F03,003C,0180,09F0,0000,11F1 :2588      Q_ID[C[K.CS]      : READ THE RUN BIT
U 11F1, 0000,003C,29F0,2C00,0000,11F2 :2589      Q_Q.AND.K[.1]      : MASK
U 11F2, 0019,2034,05C0,0800,0000,11F3 :2590      A[U_Q-D,CLK.UBCC      : CHECK
U 11F3, 001D,2000,0180,0800,0010,11F4 :2591      Z?
U 11F4, 0000,013C,0180,0800,0000,1054 :2592      =0      ERROR2,RC[OD]_Q      : RUN BIT DID NOT CLEAR
U 1054, 0001,203D,0180,09E8,0000,1184 :2593      RC[OE]_K[.2]      : SET EXPECTED DATA FOR THE COUNTER
U 1055, 0018,0038,0980,09F0,0000,11F5 :2594      Q_ID[INTERVAL],D_RC[OE]      : READ THE INTERVAL COUNTER
U 11F5, 0810,0038,2DF0,2D70,0000,11F6 :2595      A[U_Q-D,CLK.UBCC      : CHECK THAT IT INCREMENTED TWICE
U 11F6, 001D,2000,0180,0800,0010,11F7 :2596      Z?
U 11F7, 0000,013C,0180,0800,0000,1056 :2597      =0      ERROR2,RC[OD]_Q      : INTERVAL CTR DID NOT INCREMENT
U 1056, 0001,203D,0180,09E8,0000,1184 :2598
:2599
:2600      ;////////////////////
:2601
:2602      ;+
:2603      ; NOW CHECK THE RELOAD FUNCTION AND INTERRUPT REQUEST
:2604      ;-
:2605
U 1057, 0018,0038,5580,09F0,0000,1058 :2606      T161S6: RC[OE]_K[.3F]      : SET EXPECTED DATA FOR INTERVAL CTR
U 1058, 0000,003D,0180,0800,0000,1189 :2607      =0      SUBTEST
U 1059, 0000,003C,0180,0800,0000,105C :2608      NOP
U 105C, 0000,003D,0180,0800,0000,1181 :2609      =0      ERLOOP
U 105D, 0818,0038,4580,0800,0000,11F8 :2610      D_K[.8000]      : GEN. NO. TO CLEAR ERROR & INT REQ
U 11F8, 0819,0030,4180,0800,0000,11F9 :2611      D_D.OR.K[.80]
U 11F9, 0000,003C,29E0,3C00,0000,11FA :2612      ID[CLK.CS]_D,Q_D      : CLEAR THE BITS
U 11FA, 0800,003C,0180,0A08,0000,11FB :2613      D_R[1]      : GET A MINUS ONE
U 11FB, 0C00,003C,2580,3C00,0000,11FC :2614      ID[NXT.PER]_D,D_Q      : LOAD NEXT INTERVAL REG
U 11FC, 0819,0030,6580,0800,0000,11FD :2615      D_D.OR.K[.10]      : INSERT TRANSFER BIT
U 11FD, 0000,003C,2980,3C00,0000,11FE :2616      ID[CLK.CS]_D      : LOAD INTERVAL CTR REG
U 11FE, 0818,0038,5580,0800,0000,11FF :2617      D_K[.3F]
U 11FF, 0000,003C,2580,3C00,0000,1300 :2618      ID[NXT.PER]_D      : CHANGE DATA IN NEXT INTERVAL REG
U 1300, 0818,0038,0580,0800,0000,1301 :2619      D_K[.1]
U 1301, 0F00,003C,2980,3C00,0000,1302 :2620      SYNC35: ID[CLK.CS]_D,D_0      : START THE COUNTER
U 1302, 0000,003C,2980,3C00,0000,1303 :2621      ID[CLK.CS]_D      : STOP THE COUNTER
U 1303, 0810,0038,2DF0,2D70,0000,1304 :2622      Q_ID[INTERVAL],D_RC[OE]      : READ THE INTERVAL COUNTER
U 1304, 001D,2000,0180,0800,0010,1305 :2623      A[U_Q-D,CLK.UBCC      : CHECK
U 1305, 0000,013C,0180,0800,0000,1060 :2624      Z?
U 1060, 0001,203D,0180,09E8,0000,1184 :2625      =0      ERROR2,RC[OD]_Q      : RELOAD FAILED
U 1061, 0018,0038,4180,09F0,0000,1306 :2626      RC[OE]_K[.80]      : SET EXPECTED DATA FOR INT REQ BIT
U 1306, 0810,0038,29F0,2D70,0000,1307 :2627      Q_ID[C[K.CS],D_RC[OE]      : READ THE INTER REQ BIT

```



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U 1307, 001D,2000,0180,0800,0010,1308 :2628      ALU_Q-D,CLK.UBCC      ; CHECK
U 1308, 0000,013C,0180,0800,0000,1062 :2629      Z?
U 1062, 0001,203D,0180,09E8,0000,1184 :2630      =0      ERROR2,RC[0D]_Q      ; INTERRUPT REQ BIT DID NOT SET
U 1063, 0003,003C,0180,09F0,0000,1309 :2631      RC[0E]_0      ; SET EXPECTED DATA FOR CLEAR OF INTER REQ
U 1309, 0818,0038,4180,0800,0000,130A :2632      D_K[.80]
U 130A, 0000,003C,2980,3C00,0000,130B :2633      ID[CLK.CS]_D      ; CLEAR THE INTER REQ BIT
U 130B, 0F00,003C,29F0,2C00,0000,130C :2634      Q_ID[CLK.CS]_D_0      ; READ THE INTER REQ BIT
U 130C, 001D,2000,0180,0800,0010,130D :2635      ACU_Q-D,CLK.UBCC      ; CHECK
U 130D, 0000,013C,0180,0800,0000,1064 :2636      Z?
U 1064, 0001,203D,0180,09E8,0000,1184 :2637      =0      ERROR2,RC[0D]_Q      ; INTER REQ BIT DID NOT CLEAR
:2638
:2639
:2640      ;////////////////////
:2641
:2642      ;+
:2643      ; NOW CHECK THAT THE ERROR BIT SETS AND CLEARS PROPERLY
:2644      ;-
:2645
U 1065, 0818,0000,0980,0800,0000,130E :2646      T161S7: D_0-K[.2]      ; GENERATE NUMBER FOR OVERFLOW
U 130E, 0000,003C,2580,3C00,0000,1066 :2647      ID[NXT.PER]_D      ; LOAD NEXT INTERVAL REG
U 1066, 0000,003D,0180,0800,0000,1189 :2648      =0      SUBTEST
U 1067, 0000,003C,0180,0800,0000,1068 :2649      NOP
U 1068, 0000,003D,0180,0800,0000,1181 :2650      =0      ERLOOP
U 1069, 0818,0038,4580,0800,0000,130F :2651      D_K[.8000]      ; GENERATE EXPECTED DATA
U 130F, 0819,0030,4180,09F0,0000,1310 :2652      RC[0E]_D.OR.K[.80]_D_ALU      ; SAVE
U 1310, 0819,0030,6580,0800,0000,1311 :2653      D_D.OR.K[.10]
U 1311, 0000,003C,2980,3C00,0000,1312 :2654      ID[CLK.CS]_D      ; LOAD THE INTERVAL CTR
U 1312, 0818,0038,0580,0800,0000,1313 :2655      D_K[.1]
U 1313, 0000,003C,2980,3C00,0000,1314 :2656      ID[CLK.CS]_D      ; START THE COUNTER
:2657
:2658      ; MUST WAIT 15 CYCLES FOR ERROR TO SET
U 1314, 0000,003C,0180,0800,0000,1315 :2659      NOP
U 1315, 0000,003C,0180,0800,0000,1316 :2660      NOP
U 1316, 0000,003C,0180,0800,0000,1317 :2661      NOP
U 1317, 0000,003C,0180,0800,0000,1318 :2662      NOP
U 1318, 0000,003C,0180,0800,0000,1319 :2663      NOP
U 1319, 0000,003C,0180,0800,0000,131A :2664      NOP
U 131A, 0000,003C,0180,0800,0000,131B :2665      NOP
U 131B, 0000,003C,0180,0800,0000,131C :2666      NOP
U 131C, 0000,003C,0180,0800,0000,131D :2667      NOP
U 131D, 0000,003C,0180,0800,0000,131E :2668      NOP
U 131E, 0000,003C,0180,0800,0000,131F :2669      NOP
U 131F, 0000,003C,0180,0800,0000,1320 :2670      NOP
U 1320, 0000,003C,0180,0800,0000,1321 :2671      NOP
U 1321, 0F00,003C,0180,0800,0000,1322 :2672      D_0
:2673
U 1322, 0000,003C,2980,3C00,0000,1323 :2674      SYNC36: ID[CLK.CS]_D      ; STOP THE CLOCK
U 1323, 0810,0038,29F0,2D70,0000,1324 :2675      Q_ID[CLK.CS]_D_RC[0E]      ; READ THE ERROR BIT
U 1324, 001D,2000,0180,0800,0010,1325 :2676      ACU_Q-D,CLK.UBCC      ; CHECK
U 1325, 0000,013C,0180,0800,0000,106A :2677      Z?
U 106A, 0001,203D,0180,09E8,0000,1184 :2678      =0      ERROR2,RC[0D]_Q      ; ERROR BIT DID NOT SET
U 106B, 0810,0038,0180,0970,0000,1326 :2679      D_RC[0E]
U 1326, 0000,003C,2980,3C00,0000,1327 :2680      SYNC37: ID[CLK.CS]_D      ; CLEAR THE ERROR BIT
U 1327, 0F00,003C,29F0,2C00,0000,1328 :2681      Q_ID[CLK.CS]_D_0      ; READ IT BACK
U 1328, 001D,2000,0180,0800,0010,1329 :2682      ACU_Q-D,CLK.UBCC      ; CHECK

```

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```

U 1329, 0003,013C,0180,09F0,0000,106C      ;2683
U 106C, 0001,203D,0180,09E8,0000,1184        ;2684
U 106D, 0000,003C,0180,0800,0000,106E        ;2685
                                                ;2686
                                                ;2687
                                                ;2688

```

 $=0$

```
Z?,RC[OE] 0
ERROR2,RC[OD]_0
NOP
```

; ERROR BIT DID NOT CLEAR

U 106E, 0018,0039,1180,09F8,0000,116D
U 106F, 0018,0038,0580,0A80,0000,1070
U 1070, 0000,003D,0180,0800,0000,11A4
U 1071, 0003,003C,0180,09F0,0000,132A
U 132A, 0003,003C,0180,0A98,0000,132B
U 132B, 0818,0038,4580,0800,0000,132C
U 132C, 0500,003C,6580,0800,0084,732D

```
:2689 .PAGE "TEST 162 IPL ACTIVE BITS IN THE SIR REGISTER & IPL IPL ACTIVE IN PSL"
:2690 *****
:2691 **
:2692 TEST 162 IPL ACTIVE BITS IN THE SIR REGISTER & IPL IPL ACTIVE IN PSL
:2693
:2694 TEST DESCRIPTION
:2695 THIS TEST CHECKS THE DATA INTEGRITY OF THE IPL ACTIVE BITS (<20:16>)
:2696 IN THE SIR REGISTER AND THE VECTOR BITS IN THE VECTOR REGISTER.
:2697
:2698 SUBTST 1 - FILL BITS <15:0> OF THE SIR WITH ONE'S AND CHECK THAT
:2699 THE IPL ACTIVE GOES FROM 0 TO F AND THAT THE VECTOR
:2700 GOES FROM 0 TO 84 TO 88 TO 8C, ETC AND THAT THE IPL LEVEL
:2701 GETS LOADED FROM THE IPL ACTIVE LEVEL ON AN INTERRUPT ACK.
:2702 SUBTST 2 - SET THE INTERRUPT ENABLE BIT IN THE TRANSMITTER CONTROL
:2703 AND STATUS REGISTER AND CHECK THAT THE IPL ACTIVE LEVEL
:2704 GOES TO 14. THEN CLEAR THE INTERRUPT ENABLE BIT AND
:2705 THE HARDWARE INTERRUPT REQUEST AND CHECK THAT THE
:2706 IPL ACTIVE LEVEL CLEARED. ALSO CHECKS THAT THE VECTOR
:2707 COMES UP FC WHEN IPL 14 IS ACTIVE.
:2708
:2709 LOGIC DESCRIPTION
:2710 THIS TEST CHECKS THE SIR PRIORITY ENCODERS, PART OF THE HIR PRIORITY
:2711 ENCODERS, AND THE IPL ACTIVE MULTIPLEXOR, AND THE ID BUS INTERFACE
:2712 TO THE IPL ACTIVE BITS, ON THE ICL MODULE. IT ALSO CHECKS PART
:2713 OF THE VECTOR ROM AND THE VECTOR BITS IN THE VECTOR REGISTER.
:2714
:2715 ERROR DESCRIPTION
:2716 DATA: EXPECTED IPL ACTIVE BITS OR IPL BITS OR VECTOR BITS
:2717 RECEIVED IPL ACTIVE BITS OR IPL BITS OR VECTOR BITS
:2718 LOOP COUNT - SUBTST 1 ONLY -- INDICATES WHICH BIT OF THE
:2719 SIR REGISTER IS THE HIGHEST PRIORITY, I.E.
:2720 10= BIT 0, F= BIT 1, E= BIT 2, ETC.
:2721 ERROR TYPE FLAG - 0=IPL ACTIVE BITS FAILED, 1=IPL LEVEL FAILED,
:2722 AND 2 = VECTOR FAILED
:2723
:2724 SYNC POINT DESCRIPTION
:2725 SUBTST 1 - SYNC06--LOAD THE SIR REGISTER WITH THE TEST PATTERN
:2726 SYNC07--READ THE IPL ACTIVE BITS
:2727 SYNC1D--LOAD THE IPL WITH AN INTERRUPT ACK
:2728 SYNC0C--READ THE VECTOR BITS
:2729 SUBTST 2 - SYNC08--LATCH HIR LEVEL 14
:2730 SYNC09--READ THE IPL ACTIVE BITS
:2731 SYNC0D--READ THE VECTOR BITS
:2732 SYNC0A--CLEAR HIR LEVEL 14
:2733 SYNC0B--READ THE IPL ACTIVE BITS
:2734
:2735 *****
:2736 =0
:2737 T162: NEWTST[.4]
:2738 R[0] K[.1] ; INIT THE SIR DATA
:2739 =0 CALL J/UNJAM ; CLEAR ANY SBI INTERRUPTS
:2740 R[0E] 0 ; INIT THE EXPECTED DATA
:2741 R[3] 0 ; SET SAVE LOCATION FOR EXP DATA
:2742 D_K[8000] ; GEN INCREMENT FOR EXPECTED DATA
:2743 D_D.LEFT,SC_K[.10]
```

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U 132D, 0001,003C,01F8,0A88,0000,132E :2744      RC[1],D,Q_0      : SAVE IN R1
U 132E, 0818,0038,8D80,0800,0000,132F :2745      D_K[.1F]      : GENERATE MASK FOR IPL ACTIVE BITS
U 132F, 0D00,003C,0180,0800,0000,1330 :2746      D_DAL.SC      :
U 1330, 0001,003C,0180,0A90,0000,1331 :2747      RC[2],D      : SAVE
:2748
:2749 //////////////////////////////////////
:2750 :+
:2751 : CHECK IPL ACTIVE LEVELS 0 THRU F
:2752 :-
:2753
U 1331, 0018,0038,6580,09E0,0000,1072 :2754 T162S1: RC[0C],K[.10] : SET THE LOOP COUNT
U 1072, 0003,003D,0180,0AA0,0000,1189 :2755 =0 SUBTEST,RC[4],0 : SET INITIAL VECTOR
U 1073, 0800,003C,0180,0A00,0000,1332 :2756 T162L1: D,RC[0] : GET SIR DATA
U 1332, 0003,003C,0180,09D8,0000,1333 :2757 RC[0B],0 : SET ERROR TYPE FLAG
U 1333, 0000,003C,3980,3C00,0000,1074 :2758 SYNC06: ID[SIR],D : LOAD THE SIR
U 1074, 0000,003D,0180,0800,0000,1181 :2759 =0 ERLOOP
U 1075, 0810,0038,39F0,2D70,0000,1334 :2760 SYNC07: Q_ID[SIR],D,RC[0E] : GET THE IPL ACTIVE BITS
U 1334, 001C,0034,01C0,0A10,0000,1335 :2761 Q-Q.AND.R[2] : MASK
U 1335, 001D,2000,0180,0800,0010,1336 :2762 ACU_Q-D,CLK.UBCC : CHECK
U 1336, 0000,013C,0180,0800,0000,1076 :2763 Z?
U 1076, 0001,203D,0180,09E8,0000,1184 :2764 =0 ERROR2,RC[0D],Q : IPL ACTIVE BITS FAILED
:2765
:2766 :+
:2767 : NOW CHECK THAT IPL GETS LOADED FROM THE IPL ACTIVE ON AN INTERRUPT ACK.
:2768 :-
:2769
U 1077, 0018,0038,0580,09D8,0000,1078 :2770 RC[0B],K[.1] : SET ERROR TYPE FLAG
U 1078, 0000,003D,0180,0800,0000,1181 :2771 =0 ERLOOP
U 1079, 0810,0038,0180,0970,8000,1337 :2772 SYNC1D: INTRPT.ACK,D,RC[0E] : EXECUTE THE INTERRUPT ACK
U 1337, 0000,003C,3DF0,2C00,0000,1338 :2773 Q_ID[PSL] : READ THE IPL LEVEL
U 1338, 001C,0034,01C0,0A10,0000,1339 :2774 Q-Q.AND.R[2] : MASK
U 1339, 001D,2000,0180,0800,0010,133A :2775 ACU_Q-D,CLK.UBCC : CHECK
U 133A, 0000,013C,0180,0800,0000,107A :2776 Z? : BRANCH IF OK
U 107A, 0001,203D,0180,09E8,0000,1184 :2777 =0 ERROR2,RC[0D],Q : IPL DID NOT SET FROM IPL ACTIVE
:2778
:2779 :+
:2780 : NOW CHECK THE VECTOR ASSOCIATED WITH THIS IPL ACTIVE LEVEL
:2781 :-
:2782
U 107B, 0000,003C,0180,0A20,0000,133B :2783 LAB,RC[4] : LATCH EXPECTED VECTOR
U 133B, 0000,003C,0180,09F0,0000,133C :2784 RC[0E],LA : SAVE
U 133C, 0018,0038,0980,09D8,0000,107C :2785 RC[0B],K[.2] : SET ERROR TYPE FLAG
U 107C, 0000,003D,0180,0800,0000,1181 :2786 =0 ERLOOP
U 107D, 0810,0038,0180,0970,0000,133D :2787 D,RC[0E]
U 133D, 0000,003C,35F0,2C00,0000,133E :2788 SYNC0C: Q_ID[VECTOR] : READ THE VECTOR BITS
U 133E, 0019,2034,81C0,0800,0000,133F :2789 Q-Q.AND.K[.3FF] : MASK
U 133F, 001D,2000,0180,0800,0010,1340 :2790 ACU_Q-D,CLK.UBCC : CHECK
U 1340, 0000,013C,0180,0800,0000,107E :2791 Z?
U 107E, 0001,203D,0180,09E8,0000,1184 :2792 =0 ERROR2,RC[0D],Q : VECTOR IS INCORRECT
:2793
:2794 :+
:2795 : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:2796 :-
:2797
U 107F, 0800,003C,0180,0A18,0000,1341 :2798 D,R[3] : GET THE EXP DATA FOR IPL ACTIVE

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U 1341. 0000.003C.0180.0A08.0000.1342 :2799 LAB R[1]
U 1342. 001C.2014.0180.0A98.0000.1343 :2800 R[3] LA+D ; INCREMENT EXPECTED VALUE OF IPL ACTIVE
U 1343. 001C.2014.0180.09F0.0000.1344 :2801 RC[OE] LA+D
U 1344. 0800.803C.0180.0A20.0010.1345 :2802 D R[4],CLK.UBCC,BYTE ; GET EXPECTED VECTOR
U 1345. 0000.013C.0180.0800.0000.1080 :2803 Z? ; BRANCH IF ITS ZERO
U 1080. 0000.003C.0180.0800.0000.1346 :2804 =0 J/T2P1 ; NON ZERO, SO JUST INCREMENT IT
U 1081. 0818.0038.4180.0800.0000.1346 :2805 D K[.80] ; SET VECTOR FOR IPL ACTIVE 1
U 1346. 0019.0014.1180.0AA0.0000.1347 :2806 T2P1: R[4] D+K[.4] ; INCREMENT CURRENT EXPECTED VECTOR
U 1347. 0000.003C.01C0.0A00.0000.1348 :2807 Q R[0] ; GET SIR DATA
U 1348. 0000.003C.03A8.0800.0000.1349 :2808 Q-Q.LEFT,S1/MUL- ; GENERATE NEXT PATTERN
U 1349. 0001.203C.0180.0A80.0000.134A :2809 R[0] Q ; SAVE
U 134A. 0810.0038.0180.0960.0000.134B :2810 D RC[0C]
U 134B. 0019.8000.0580.09E0.0010.134C :2811 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 134C. 0000.013C.0180.0800.0000.1082 :2812 Z?
U 1082. 0000.003C.0180.0800.0000.1073 :2813 =0 J/T162L1 ; CONTINUE
:2814
:2815
:2816 :////////////////////
:2817 :+
:2818 : NOW CHECK HIR 14 (ALSO IPL ACTIVE 14) BY SETTING THE INTERRUPT
:2819 : ENABLE BIT IN THE TXCS REGISTER
:2820 :-
:2821
U 1083. 0F00.003C.6580.0800.0084.734D :2822 T162S2: D 0,SC K[.10]
U 134D. 0000.003C.3980.3C00.0000.1084 :2823 ID[SIR]_D ; ENSURE SIR IS CLEAR
U 1084. 0000.003D.0180.0800.0000.1189 :2824 =0 SUBTEST
U 1085. 0818.0038.21F8.0800.0000.134E :2825 D K[.14],Q_0 ; GENERATE THE EXPECTED DATA
U 134E. 0D00.003C.0180.0800.0000.134F :2826 D-DAL,SC
U 134F. 0001.003C.0180.09F0.0000.1350 :2827 RC[OE]_D ; SAVE
U 1350. 0003.003C.0180.09D8.0000.1086 :2828 RC[OB]_0 ; SET ERROR TYPE FLAG
U 1086. 0000.003D.0180.0800.0000.1181 :2829 =0 ERLOOP
U 1087. 0F00.003C.0180.0800.0000.1351 :2830 D 0
U 1351. 0000.003C.1980.3C00.0000.1352 :2831 ID[TXCS]_D ; ENSURE INTERRUPT ENABLE CLEAR
U 1352. 0818.0038.3180.0800.0000.1353 :2832 D K[.40]
U 1353. 0000.003C.1980.3C00.0000.1354 :2833 ID[TXCS]_D ; SET THE INTERRUPT ENABLE BIT
U 1354. 0000.003C.0180.0800.0000.1355 :2834 NOP ; ALLOW SYNC CXMT INTR TO SET
U 1355. 0000.003C.0180.0800.4000.1356 :2835 SYNC08: INTRPT.STROBE ; LATCH THE CONSOLE INTERRUPT
U 1356. 0810.0038.39F0.2D70.0000.1357 :2836 SYNC09: Q ID[SIR]_D RC[OE] ; READ THE IPL ACTIVE BITS
U 1357. 001C.0034.01C0.0A10.0000.1358 :2837 Q-Q.AND.R[2] ; MASK
U 1358. 001D.2000.0180.0800.0010.1359 :2838 ACU_Q-D,CLK.UBCC ; CHECK
U 1359. 0000.013C.0180.0800.0000.1088 :2839 Z?
U 1088. 0001.203D.0180.09E8.0000.1184 :2840 =0 ERROR2,RC[0D]_Q ; IPL ACTIVE INCORRECT
:2841
:2842 :+
:2843 : NOW CHECK THE VECTOR FOR IPL ACTIVE 14
:2844 :-
:2845
U 1089. 0018.0038.0980.09D8.0000.108A :2846 RC[OB] K[.2] ; SET THE ERROR TYPE FLAG
U 108A. 0818.0039.6180.0800.0000.1186 :2847 =0 D K[.F],CALL,J/DCC ; GENERATE THE VECTOR
U 108B. 0001.003C.0180.09F0.0000.108C :2848 RC[OE]_D ; SAVE
U 108C. 0000.003D.0180.0800.0000.1181 :2849 =0 ERLOOP
U 108D. 0000.003C.35F0.2C00.0000.135A :2850 Q ID[VECTOR] ; READ THE VECTOR REG
U 135A. 0019.2034.81C0.0800.0000.135B :2851 Q-Q.AND.K[.3FF] ; MASK
U 135B. 0810.0038.0180.0970.0000.135C :2852 D-RC[OE]
U 135C. 001D.2000.0180.0800.0010.135D :2853 ACU_Q-D,CLK.UBCC ; CHECK

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U 135D, 0000,013C,0180,0800,0000,108E :2854
U 108E, 0001,203D,0180,09E8,0000,1184 :2855 =0 ERROR2,RC[0D]_Q ; VECTOR INCORRECT
U 108F, 0000,003C,6580,0800,0084,735E :2856 SC_K[10]
U 135E, 0818,0038,21F8,0800,0000,135F :2857 D_RC[14]_Q_0 ; GENERATE EXPECTED DATA
U 135F, 0D00,003C,0180,0800,0000,1360 :2858 D_DAL.SC ;
U 1360, 0001,003C,0180,09F0,0000,1090 :2859 RC[0E]_D ; SAVE
U 1090, 0000,003D,0180,0800,0000,1181 :2860 ERLOOP
U 1091, 0018,0038,0580,09D8,0000,1361 :2861 RC[0B]_K[1] ; SET ERROR TYPE FLAG
U 1361, 0F00,003C,0180,0800,0000,1362 :2862 D_0
U 1362, 0000,003C,1980,3C00,0000,1363 :2863 ID[TXCS]_D ; CLEAR IE BIT
U 1363, 0810,0038,0180,0970,8000,1364 :2864 INTRPT_ACK,D_RC[0E] ; LOAD THE IPL LEVEL
U 1364, 0000,003C,3DF0,2C00,0000,1365 :2865 Q_ID[PSL] ; GET IPL LEVEL
U 1365, 001C,0034,01C0,0A10,0000,1366 :2866 Q-Q.AND.R[2] ; MASK
U 1366, 001D,2000,0180,0800,0010,1367 :2867 A[U_Q-D,CLK.UBCC ; IPL OK?
U 1367, 0000,013C,0180,0800,0000,1092 :2868 Z?
U 1092, 0001,203D,0180,09E8,0000,1184 :2869 =0 ERROR2,RC[0D]_Q ; IPL LEVEL INCORRECT
U 1093, 0003,003C,0180,09F0,0000,1368 :2870 RC[0E]_0 ; SET THE EXPECTED DATA
U 1368, 0003,003C,0180,09D8,0000,1369 :2871 RC[0B]_0 ; SET THE ERROR TYPE FLAG
U 1369, 0000,003C,0180,0800,4000,136A :2872 SYNCOA: INTRPT-STROBE ; CLEAR HIR 14
U 136A, 0F00,003C,39F0,2C00,0000,136B :2873 SYNCOB: Q_ID[SIR]_D_0 ; READ THE IPL ACTIVE BITS
U 136B, 001C,0034,01C0,0A10,0000,136C :2874 Q-Q.AND.R[2] ; MASK
U 136C, 001D,2000,0180,0800,C010,136D :2875 A[U_Q-D,CLK.UBCC ; CHECK
U 136D, 0000,013C,0180,0800,0000,1094 :2876 Z?
U 1094, 0001,203D,0180,09E8,0000,1184 :2877 =0 ERROR2,RC[0D]_Q ; IPL 14 DID NOT CLEAR
U 1095, 0000,003C,0180,0800,0000,1096 :2878 NOP
:2879
:2880
:2881
    
```

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:2882 .PAGE 'TEST 163 BRANCH ENABLE E -- INTERRUPT'
:2883 .*****
:2884 .++
:2885 .TEST 163 BRANCH ENABLE E --- INTERRUPT
:2886 .
:2887 .TEST DESCRIPTION
:2888 .THIS TEST CHECKS THE INTERRUPT PENDING BRANCH.
:2889 .
:2890 .SUBTST 1 - CHECK THAT BRANCH BIT 1 IS ASSERTED AND THAT BRANCH
:2891 .BIT 0 AND 2 ARE DEASSERTED.
:2892 .SUBTST 2 - SET A SOFTWARE INTERRUPT REQUEST AND CHECK THAT BRANCH
:2893 .BITS 0 AND 1 ASSERT, AND BRANCH BIT 2 IS DEASSERTED.
:2894 .
:2895 .LOGIC DESCRIPTION
:2896 .THIS TEST CHECKS THE BRANCH MULTIPLEXORS ON THE ICL MODULE.
:2897 .
:2898 .ERROR DESCRIPTION
:2899 .DATA: EXPECTED BRANCH BITS <2:0>
:2900 .RECEIVED BRANCH BITS <2:0>
:2901 .
:2902 .SYNC POINT DESCRIPTION
:2903 .ADDRESS SYNC1F--BRANCH E IS ENABLED
:2904 .--
:2905 .*****
:2906 .
:2907 T163: NEWTST[.2]
:2908 RC[OE]_K[.2]_D_0 ; INIT EXPECTED BRANCH BITS
:2909 ID[SIR]_D ; ENSURE THE SIR IS CLEAR
:2910 .
:2911 .////////////////////
:2912 .+
:2913 .CHECK BRANCH BITS <2:0>=010
:2914 .-
:2915 .
:2916 =0
:2917 T163S1: SUBTEST,ID[PSL]_D ; ENSURE THE PSL IS CLEAR
:2918 NOP
:2919 =0 ERLOOP
:2920 D RC[OE] ; GET EXPECTED BRANCH BITS
:2921 =0 CALL,J/TSTBRE ; GO EXECUTE THE BRANCH
:2922 ALU_Q-D,CLK.UBCC,BYTE ; CHECK RESULT OF BRANCH
:2923 Z?
:2924 =0 ERROR2,RC[OD]_Q ; BRANCH ENABLE E FAILED
:2925 .
:2926 .////////////////////
:2927 .+
:2928 .CHECK THAT BRANCH BIT 0 ASSERTS
:2929 .-
:2930 .
:2931 T163S2: RC[OE]_K[.3] ; SET THE EXPECTED BRANCH BITS
:2932 =0 SUBTEST,D_K[.2]
:2933 ID[SIR]_D ; SET AN INTERRUPT AT LEVEL 1
:2934 =0 ERLOOP
:2935 D RC[OE]
:2936 =0 CALL,J/TSTBRE ; GO EXECUTE THE BRANCH

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U 1096, 0018,0039,0980,09F8,0000,116D
U 1097, 0F18,0038,0980,09F0,0000,136E
U 136E, 0000,003C,3980,3C00,0000,1098

U 1098, 0000,003D,3D80,3C00,0000,1189
U 1099, 0000,003C,0180,0800,0000,109A
U 109A, 0000,003D,0180,0800,0000,1181
U 109B, 0810,0038,0180,0970,0000,109C
U 109C, 0000,003D,0180,0800,0000,1372
U 109D, 001D,A000,0180,0800,0010,136F
U 136F, 0000,013C,0180,0800,0000,109E
U 109E, 0001,203D,0180,09E8,0000,1184

U 109F, 0018,0038,0D80,09F0,0000,10A0
U 10A0, 0818,0039,0980,0800,0000,1189
U 10A1, 0000,003C,3980,3C00,0000,10A2
U 10A2, 0000,003D,0180,0800,0000,1181
U 10A3, 0810,0038,0180,0970,0000,10A4
U 10A4, 0000,003D,0180,0800,0000,1372

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U 10A5, 001D,A000,0180,0800,0010,1370 :2937      ALU_Q-D,CLK.UBCC,BYTE      ; CHECK THE BRANCH BITS
U 1370, 0000,013C,0180,0800,0000,10A6 :2938      Z?
U 10A6, 0001,203D,0180,09E8,0000,1184 :2939      =0      ERROR2,RC[0D]_Q      ; BRANCH E FAILED
U 10A7, 0F00,003C,0180,0800,0000,1371 :2940      D_0
U 1371, 0000,003C,3980,3C00,0000,1374 :2941      ID[SIR]_D,J/T163END      ; CLEAR THE INTERRUPT
:2942
:2943
:2944      ;+
:2945      ; THIS TABLE ENABLES THE BRANCH E. IT EXITS WITH A NUMBER
:2946      ; IN THE Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT ASSERTED.
:2947      ;-
:2948
U 1372, 0000,0E3C,0180,0800,0000,1010 :2949      SYNC1F:
U 1010, 0000,003E,01F8,0800,0000,0001 :2950      TSTBRE: AC.LOW?
U 1011, 0018,003A,05C0,0800,0000,0001 :2951      =000      Q_0,RETURN1      ; EXECUTE THE BRANCH
U 1012, 0018,003A,09C0,0800,0000,0001 :2952      Q_K[.1],RETURN1
U 1013, 0018,003A,0DC0,0800,0000,0001 :2953      Q_K[.2],RETURN1
U 1014, 0018,003A,11C0,0800,0000,0001 :2954      Q_K[.3],RETURN1
U 1015, 0018,0038,11C0,0800,0000,1373 :2955      Q_K[.4],RETURN1
U 1016, 0018,003A,D5C0,0800,0000,0001 :2956      Q_K[.4],J/INCO
U 1017, 0018,003A,5DC0,0800,0000,0001 :2957      Q_K[.6],RETURN1
U 1373, 0019,2016,05C0,0800,0000,0001 :2958      Q_K[.7],RETURN1
:2959      INCO: Q_Q+K[.1],RETURN1
:2960
:2961
:2962
U 1374, 0000,003C,0180,0800,0000,10A8 :2963      T163END:NOP
:2964

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2965 .PAGE 'TEST 164 INTERRUPT REQUEST COMPARATOR'
2966 .*****
2967 .++
2968 .TEST 164 INTERRUPT REQUEST COMPARATOR
2969 .
2970 .TEST DESCRIPTION
2971 .THIS TEST CHECKS THE INTERRUPT REQUEST COMPARATOR BY RUNNING A
2972 .COUNT PATTERN THRU THE IPL FOR EACH OF THE FIRST 16 LEVELS OF
2973 .IPL ACTIVE AND USES THE INTERRUPT BRANCH TO DETECT WHETHER
2974 .THE INTERRUPT REQUEST SIGNAL IS ACTIVE.
2975 .
2976 .SUBTST 1 - RUN A COUNT PATTERN THRU THE IPL FOR EACH OF 16 LEVELS
2977 .OF IPL ACTIVE.
2978 .FOLLOWING IS A TABLE THAT SHOWS THE EXPECTED BRANCH
2979 .CONDITION FOR EACH VALUE OF THE IPL AND IPL ACTIVE BITS:
2980 .
2981 .      IPL ACTIVE      IPL      BRANCH BIT 0
2982 .      -----      ---      -----
2983 .
2984 .      0      0-F      FALSE
2985 .      1      0      TRUE
2986 .      2      1-F      FALSE
2987 .      3      0-1      TRUE
2988 .      4      2-F      FALSE
2989 .      5      0-2      TRUE
2990 .      6      3-F      FALSE
2991 .      7      0-3      TRUE
2992 .      8      4-F      FALSE
2993 .      9      0-4      TRUE
2994 .      A      5-F      FALSE
2995 .      B      0-5      TRUE
2996 .      C      6-F      FALSE
2997 .      D      0-6      TRUE
2998 .      E      7-F      FALSE
2999 .      F      0-7      TRUE
3000 .      10     8-F      FALSE
3001 .      11     0-8      TRUE
3002 .      12     9-F      FALSE
3003 .      13     0-9      TRUE
3004 .      14     A-F      FALSE
3005 .      15     0-A      TRUE
3006 .      16     B-F      FALSE
3007 .      17     0-B      TRUE
3008 .      18     C-F      FALSE
3009 .      19     0-C      TRUE
3010 .      20     D-F      FALSE
3011 .      21     0-D      TRUE
3012 .      22     E-F      FALSE
3013 .      23     0-E      TRUE
3014 .      24     F      FALSE
3015 .
3016 .SUBTST 2 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL OF LESS
3017 .THAN 10 ENABLES "INTERRUPT REQUEST".
3018 .SUBTST 3 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL OF LESS
3019 .THAN 14 BUT GREATER THAN F ENABLES "INTERRUPT REQUEST".
3020 .SUBTST 4 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL GREATER
  
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3020      THAN OR EQUAL TO 14 DOES NOT ASSERT "INTERRUPT REQUEST".
3021
3022      LOGIC DESCRIPTION
3023      THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT GENERATES THE
3024      SIGNAL "INTR REQ".
3025
3026      ERROR DESCRIPTION
3027      DATA: EXPECTED BRANCH BIT 0
3028             RECEIVED BRANCH BIT 0
3029             LOOP COUNT FOR THE IPL LEVEL - SUBTST 1 ONLY -- INDICATES
3030             WHICH IPL LEVEL IS CURRENTLY SET, I.E. 10=0, F=1, ETC.
3031             LOOP COUNT FOR THE IPL ACTIVE LEVEL - SUBTST 1 ONLY -- INDICATES
3032             WHICH IPL ACTIVE LEVEL IS CURRENTLY SET, I.E. 10=0, F=1, ETC.
3033
3034      SYNC POINT DESCRIPTION
3035      SUBTST 1 - SYNC0E--INTERRUPT REQ SHOULD BE STABLE
3036      SUBTST 2 - SYNC0F--INTERRUPT REQ SHOULD BE STABLE
3037      SUBTST 3 - SYNC10--INTERRUPT REQ SHOULD BE STABLE
3038      SUBTST 4 - SYNC11--INTERRUPT REQ SHOULD BE STABLE
3039
3040      *****
3041      =0
3042      T164: NEWTST[.4]
3043            RC[0]_K[.1],D_K[.1]      : INITIALIZE THE SIR DATA
3044            SC_K[.10],Q_0             : SETUP FOR D SHIFT OF 16
3045            D_BAL.SC                  : GENERATE INCREMENT FOR IPL LEVEL
3046      =0      RC[1]_D,CALL[UNJAM]      : CLEAR ANY SBI INTERRUPTS
3047            RC[2]_0                   : INITIALIZE THE IPL ACTIVE LEVEL
3048            RC[3]_0                   : INITIALIZE THE IPL LEVEL
3049            RC[0E]_0,D_0              : INITIALIZE EXPECTED BRANCH BIT
3050            ID[PSL]_D                 : INIT THE IPL LEVEL
3051            ID[CES]_D                 : ENSURE TRAP CODES CLEAR
3052
3053      :////////////////////
3054      :+
3055      : CHECK THE INTERRUPT REQUEST COMPARATOR
3056      :-
3057
3058      T164S1: RC[0B]_K[.10]           : SET LOOP COUNT OF IPL ACTIVE
3059      =0      SUBTEST,RC[0C]_K[.10]   : SET LOOP COUNT OF IPL LEVEL
3060      T164L1: D_RC[0]                 : GET SIR DATA TO SET IPL ACTIVE
3061            ID[SIR]_D                 : SET THE SIR
3062            D_RC[3]                   : GET THE IPL LEVEL
3063            ID[PSL]_D                 : SET THE IPL LEVEL
3064      =0      ERLOOP
3065      SYNC0E: D_RC[0E],AC.LOW?        : EXECUTE THE BRANCH
3066      =110    Q_0,J/X                 : BRANCH BIT DID NOT ASSERT
3067            Q_K[.1]                   : BRANCH BIT ASSERTED
3068      X:      ACU_Q-D,CLK.UBCC,BYTE    : CHECK HTE ADDRESS
3069      Z?
3070      =0      ERROR2,RC[0D]_Q         : INTERRUPT REQ FAILED
3071
3072      :+
3073      : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
3074      :-

```

U 10A8, 0018,0039,1180,09F8,0000,116D
 U 10A9, 0818,0038,0580,0A80,0000,1375
 U 1375, 0000,003C,65F8,0800,0084,7376
 U 1376, 0D00,003C,0180,0800,0000,10AA
 U 10AA, 0001,003D,0180,0A88,0000,11A4
 U 10AB, 0003,003C,0180,0A90,0000,1377
 U 1377, 0003,003C,0180,0A98,0000,1378
 U 1378, 0F03,003C,0180,09F0,0000,1379
 U 1379, 0000,003C,3D80,3C00,0000,137A
 U 137A, 0000,003C,3180,3C00,0000,137B

U 137B, 0018,0038,6580,09D8,0000,10AC
 U 10AC, 0018,0039,6580,09E0,0000,1189
 U 10AD, 0800,003C,0180,0A00,0000,137C
 U 137C, 0000,003C,3980,3C00,0000,137D
 U 137D, 080C,003C,0180,0A18,0000,137E
 U 137E, 0000,003C,3D80,3C00,0000,10AE
 U 10AE, 0000,003D,0180,0800,0000,1181
 U 10AF, 0810,0E38,0180,0970,0000,101E
 U 101E, 0000,003C,01F8,0800,0000,137F
 U 101F, 0018,0038,05C0,0800,0000,137F
 U 137F, 001D,A000,0180,0800,0010,1380
 U 1380, 0000,013C,0180,0800,0000,10B0
 U 10B0, 0001,203D,0180,09EB,0000,1184

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U 10B1, 0800,003C,0180,0A18,0000,1381
U 1381, 0000,003C,0180,0A08,0000,1382
U 1382, 001C,2014,0180,0A98,0000,1383
U 1383, 0810,0038,0180,0960,0000,1384
U 1384, 0019,8000,0580,09E0,0010,1385
U 1385, 0000,013C,0180,0800,0000,10B2
U 10B2, 0000,003C,0180,0800,0000,1390
U 10B3, 0003,003C,0180,0A98,0000,1386
U 1386, 0800,003C,0180,0A10,0000,1387
U 1387, 0000,003C,0180,0A08,0000,1388
U 1388, 001C,2014,0180,0A90,0000,1389
U 1389, 0800,003C,0180,0A00,0000,138A
U 138A, 0500,003C,0180,0800,0000,138B
U 138B, 0001,003C,0180,0A80,0000,138C
U 138C, 0018,0038,6580,09E0,0000,138D
U 138D, 0810,0038,0180,0958,0000,138E
U 138E, 0019,8000,0580,09D8,0010,138F
U 138F, 0000,013C,0180,0800,0000,10B4
U 10B4, 0000,003C,0180,0800,0000,1390
U 10B5, 0000,003C,0180,0800,0000,1394

3075
3076 D R[3]
3077 LAB R[1]
3078 R[3] LA+D
3079 D R[0C]
3080 R[0C]_D-K[.1],CLK.UBCC,BYTE
3081 Z?
3082 =0 J/T164P1
3083 R[3] 0
3084 D R[2]
3085 LAB R[1]
3086 R[2] LA+D
3087 D R[0]
3088 D-D.LEFT
3089 R[0] D
3090 R[0C] K[.10]
3091 D R[0B]
3092 R[0B]_D-K[.1],CLK.UBCC,BYTE
3093 Z?
3094 =0 J/T164P1
3095 J/T164S2
3096
3097
3098
3099
3100
3101 T164P1: D R[2]
3102 Q-R[3]
3103 A[U_Q-D,CLK.UBCC
3104 ALU-N?
3105 =0111 R[0E]_0,J/T164L1
3106 R[0E]_K[.1],J/T164L1
3107
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3113
3114 T164S2: D K[.40]
3115 ID[TXCS]_D
3116 =0 SUBTEST
3117 INTRPT.STROBE,D_0
3118 ID[PSL] D
3119 R[0E] K[.1]
3120 =0 SETRCF[.2]
3121 NOP
3122 =0 ERLOOP
3123 D R[0E],AC.LOW?
3124 =110 Q_0,J/XX
3125 Q-K[.1]
3126 XX: A[U_Q-D,CLK.UBCC,BYTE
3127 Z?
3128 =0 ERROR2,R[0D]_0
3129

; GET CURRENT IPL LEVEL
; LATCH THE INCREMENT VALUE
; INCREMENT THE IPL LEVEL
; DECREMENT IPL LOOP COUNT
; GO CHECK EXPECTED BRANCH BIT
; SET IPL LEVEL TO ZERO
; GET CURRENT ACTIVE IPL LEVEL
; LATCH INCREMENT VALUE
; INCREMENT ACTIVE IPL LEVEL
; GET SIR DATA
; GENERATE NEXT SIR LEVEL
; SAVE
; INIT IPL LOOP COUNT
; DECREMENT ACTIVE IPL LOOP COUNT
; GO CHECK EXPECTED BRANCH BIT
; GO TO NEXT TEST

;+
; CALCULATE THE EXPECTED IB ADDRESS
;-

;//////////////////////////////////////
;+
; NOW CHECK INTERRUPT REQUEST AT IPL ACTIVE 4 AND NOT IPL 4
;-

U 1390, 0800,003C,0180,0A10,0000,1391
U 1391, 0000,003C,01C0,0A18,0000,1392
U 1392, 001D,2000,0180,0800,0010,1393
U 1393, 0000,1B3C,0180,0800,0000,1007
U 1007, 0003,003C,0180,09F0,0000,10AD
U 100F, 0018,0038,0580,09F0,0000,10AD

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:3130 :////////////////////
:3131 :+
:3132 : NOW CHECK IPL ACTIVE 4*IPL 4*REQ GT IPL
:3133 :-
:3134 :
U 10BD, 0000,003C,0180,0800,0000,10BE :3135 T164S3: NOP
U 10BE, 0000,003D,0180,0800,0000,1189 :3136 =0 SUBTEST
U 10BF, 0818,0038,65F8,0800,0082,139A :3137 D_K[.10],SC_ALU,Q_0 : GENERATE IPL OF 10
U 139A, 0D00,003C,0180,0800,0000,139B :3138 D_DAL.SC :
U 139B, 0000,003C,3D80,3C00,0000,10C0 :3139 ID[PSL]_D : LOAD IPL OF 10
U 10C0, 0000,003D,0180,0800,0000,1181 :3140 =0 ERLOOP
U 10C1, 0810,0E38,0180,0970,0000,102E :3141 D_RC[OE],AC.LOW? : EXECUTE THE BRANCH
U 102E, 0000,003C,01F8,0800,0000,139C :3142 =110 Q_0,J/XXX : BRANCH BIT DID NOT ASSERT
U 102F, 0018,0038,05C0,0800,0000,139C :3143 Q_K[.1] : BRANCH BIT ASSERTED
U 139C, 001D,A000,0180,0800,0010,139D :3144 XXX: A[U_Q-D,CLK.UBCC,BYTE : CHECK THE ADDRESS
U 139D, 0000,013C,0180,0800,0000,10C2 :3145 Z?
U 10C2, 0001,203D,0180,09E8,0000,1184 :3146 =0 ERROR2,RC[OD]_Q : INTER REQ DID NOT SET
:3147 :
:3148 :////////////////////
:3149 :+
:3150 : NOW CHECK IPL ACTIVE 4*IPL 4*-REQ GT IPL
:3151 :-
:3152 :
U 10C3, 0003,003C,0180,09F0,0000,10C4 :3153 T164S4: RC[OE] 0 : SET BRANCH BIT FALSE
U 10C4, 0000,003D,0180,0800,0000,1189 :3154 =0 SUBTEST
U 10C5, 0818,0038,21F8,0800,0000,139E :3155 D_K[.14],Q_0 : GENERATE IPL VALUE
U 139E, 0D00,003C,0180,0800,0000,139F :3156 D_DAL.SC :
U 139F, 0000,003C,3D80,3C00,0000,10C6 :3157 ID[PSL]_D : LOAD IPL OF 14
U 10C6, 0000,003D,0180,0800,0000,1181 :3158 =0 ERLOOP
U 10C7, 0810,0E38,0180,0970,0000,1036 :3159 D_RC[OE],AC.LOW? : EXECUTE THE BRANCH
U 1036, 0000,003C,01F8,0800,0000,13A0 :3160 =110 Q_0,J/XXXX : BRANCH BIT DID NOT ASSERT
U 1037, 0018,0038,05C0,0800,00C0,13A0 :3161 Q_K[.1] : BRANCH BIT ASSERTED
U 13A0, 001D,A000,0180,0800,0010,13A1 :3162 XXXX: A[U_Q-D,CLK.UBCC,BYTE : CHECK THE ADDRESS
U 13A1, 0000,013C,0180,0800,0000,10C8 :3163 Z?
U 10C8, 0001,203D,0180,09E8,0000,1184 :3164 =0 ERROR2,RC[OD]_Q : INTER REQ DID NOT DEASSERT
U 10C9, 0F00,003C,0180,0800,0000,13A2 :3165 D_0
U 13A2, 0000,003C,1980,3C00,0000,13A3 :3166 ID[TXCS]_D : CLEAR IE BIT
U 13A3, 0000,003C,0180,0800,8000,13A4 :3167 INTRPT.ACK : CLEAR THE INTERRUPT REQUEST
U 13A4, 0000,003C,0180,0800,4000,10CA :3168 INTRPT.STROBE : CLEAR THE IPL ACTIVE
:3169 :
:3170 :

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3171 .PAGE 'TEST 165 INSTRUCTION BUFFER SERVICE BIT GENERATION'
3172 .*****
3173 .++
3174 .TEST 165 INSTRUCTION BUFFER SERVICE BIT GENERATION
3175
3176 .TEST DESCRIPTION
3177 .THIS TEST CHECKS THE GENERATION OF THE SERVICE BITS TO THE
3178 .INSTRUCTION BUFFER. THIS IS DONE BY LOADING THE INSTRUCTION
3179 .BUFFER WITH VALID DATA, ENABLING THE "SERVICE" SIGNAL ON ICL,
3180 .AND EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING THE RESULTANT
3181 .MICRO PC BITS <7:0>.
3182
3183 .SUBTST 1 - CHECK INTR REQ AND PSL TP TRUE AND HALT PENDING FALSE.
3184 .SUBTST 2 - CHECK PSL TP TRUE AND INTR REQ AND HALT PENDING FALSE.
3185 .SUBTST 3 - CHECK INTERN REQ TRUE AND "SERVICE" TRUE DUE TO
3186 .ARITHMETIC TRAP BEING TRUE. EACH OF THE THREE TRAP CODES
3187 .IS CHECKED INDIVIDUALLY TO ENSURE THEY ENABLE THE
3188 .ARITHMETIC TRAP.
3189
3190 .LOGIC DESCRIPTION
3191 .THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE INSTRUCTION BUFFER
3192 .SERVICE BITS ON THE ICL MODULE. IT ALSO CHECKS THE LOGIC
3193 .ON THE IRC MODULE THAT GENERATES THE "SRV+INV" SIGNAL FROM THE
3194 ."SERVICE" SIGNAL ON ICL.
3195
3196 .ERROR DESCRIPTION
3197 .DATA: EXPECTED MICRO PC BITS <7:0>
3198 .RECEIVED MICRO PC BITS <7:0>
3199 .LOOP COUNT - SUBTST 3 ONLY -- INDICATES WHICH ARITHMETIC
3200 .TRAP CODE SHOULD BE CAUSING THE ARITHMETIC TRAP, I.E.
3201 .3= TRAP CODE 0, 2= TRAP CODE 1, 1= TRAP CODE 2
3202
3203 .SYNC POINT DESCRIPTION
3204 .ADDRESS SYNC00 - MICRO PC BITS <7:0> ARE ENABLED FROM THE INSTRUCTION
3205 .BUFFER AT THE MICROINSTRUCTION FOLLOWING THIS ONE.
3206 .SERVICE BITS ARE VALID AT THIS INSTRUCTION.
3207 .--
3208 .*****
3209 .
3210 U 10CA, 0018,0039,0980,09F8,0000,116D T165: NEWTST[.2]
3211 U 10CB, 0000,003C,0180,0800,0000,10CC NOP
3212 U 10CC, 0000,003D,0180,0800,0000,11A4 =0 CALL,J/UNJAM ; CLEAR ANY SBI INTERRUPTS
3213
3214 .////////////////////
3215 .+
3216 .FIRST CHECK -HP*PSL TP*INTR REQ
3217 .-
3218
3219 U 10CD, 0018,0038,7980,09F0,0000,10CE T165S1: RC[OE] K[.30] ; SET THE EXPECTED ADDRESS
3220 U 10CE, 0000,003D,0180,0800,0000,1189 =0 SUBTEST
3221 U 10CF, 0818,0038,3180,0800,0000,13A5 D_K[.40]
3222 U 13A5, 0800,003C,6580,0800,0000,13A6 D_D.SWAP,KMX/.10 ; GENERATE PSL DATA
3223 U 13A6, 0819,0014,6580,0A80,0000,13A7 D_D+K[.10],R[0]_ALU ; ADD THE T BIT
3224 U 13A7, 0000,003C,3D80,3C00,0000,13A8 ID[PSL]_D ; LOAD THE PSL
3225 U 13A8, 0818,0038,0980,0800,0000,13A9 D_K[.2] ; SET SIR FOR IPL ACTIVE OF 1

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U 13A9, 0F00,003C,3980,3C00,0000,13AA :3226 ID[SIR]_D,D_0
U 13AA, 0000,003C,3180,3C00,0000,10D0 :3227 ID[CES]_D ; ENSURE TRAP CODES ARE CLEAR
U 10D0, 0000,003D,0180,0800,0000,1181 :3228 =0 ERLOOP
U 10D1, 0000,003C,0180,0800,0000,10D2 :3229 NOP
U 10D2, 2003,003D,0180,0800,4200,119D :3230 =0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10D3, 0810,0038,0180,0970,0000,10D4 :3231 D R[OE] ; GET EXPECTED ADDRESS
U 10D4, 0000,003D,0180,0800,0000,119C :3232 =0 CALL,J/CALL3 ; EXECUTE THE A FORK
U 10D5, 001D,A000,0180,0800,0010,13AB :3233 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
U 13AB, 0000,013C,0180,0800,0000,10D6 :3234 Z?
U 10D6, 0001,203D,0180,09E8,0000,1184 :3235 =0 ERROR2,RC[OD]_Q ; SERVICE BITS INCORRECT
:3236
:3237 :////////////////////
:3238 :+
:3239 : NOW CHECK -HP*PSL TP*-INTR REQ
:3240 :-
:3241

U 10D7, 0018,0038,E980,09F0,0000,10D8 :3242 T165S2: RC[OE] K[.24] ; SET THE EXPECTED ADDRESS
U 10D8, 0000,003D,0180,0800,0000,1189 :3243 =0 SUBTEST
U 10D9, 0800,003C,0180,0A00,0000,13AC :3244 D R[0] ; GET PSL DATA
U 13AC, 0F00,003C,3D80,3C00,0000,13AD :3245 ID[PSL]_D,D_0 ; LOAD THE TP BIT
U 13AD, 0000,003C,3980,3C00,0000,10DA :3246 ID[SIR]_D ; CLEAR THE SIR REGISTER
U 10DA, 0000,003D,0180,0800,0000,1181 :3247 =0 ERLOOP
U 10DB, 0000,003C,0180,0800,0000,10DC :3248 NOP
U 10DC, 2003,003D,0180,0800,4200,119D :3249 =0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DD, 0810,0038,0180,0970,0000,10DE :3250 D R[OE]
U 10DE, 0000,003D,0180,0800,0000,119C :3251 =0 CALL,J/CALL3 ; EXECUTE THE A FORK
U 10DF, 001D,A000,0180,0800,0010,13AE :3252 ALU_Q-D,CLK.UBCC,BYTE ; CHECK THE ADDRESS
U 13AE, 0000,013C,0180,0800,0000,10E0 :3253 Z?
U 10E0, 0001,203D,0180,09E8,0000,1184 :3254 =0 ERROR2,RC[OD]_Q ; SERVICE BITS INCORRECT
:3255
:3256 :////////////////////
:3257 :+
:3258 : NOW CHECK THAT IRD STATE AND ARITH TRAP GENERATE THE CORRECT
:3259 : SERVICE BITS
:3260 :-
:3261

U 10E1, 0000,003C,0180,0800,0000,10E2 :3262 T165S3: NOP
U 10E2, 0000,003D,0D80,0800,0084,718B :3263 =0 SETRCF[.3]
U 10E3, 0000,003C,0180,0800,0000,10E4 :3264 NOP
U 10E4, 0818,0039,0D80,0800,0000,1186 :3265 =0 D K[.3],CALL,J/DCC ; GENERATE THE EXPECTED ADDRESS
U 10E5, 0001,003C,0180,09F0,0000,10E6 :3266 RC[OE]_D
U 10E6, 0000,003D,0180,0800,0000,1189 :3267 =0 SUBTEST
U 10E7, 0818,0038,7580,0800,0000,13AF :3268 D K[.20] ; SET THE IV BIT IN THE PSL
U 13AF, 0000,003C,3D80,3C00,0000,13B0 :3269 ID[PSL]_D
U 13B0, 0F18,0038,6580,0A80,0000,13B1 :3270 RC[0] K[.10],D_0 ; SET INITIAL CES DATA
U 13B1, 0000,003C,3980,3C00,0000,13B2 :3271 ID[SIR]_D ; CLEAR THE SIR REGISTER
:3272

U 13B2, 0018,0038,0D80,09E0,0000,13B3 :3273 T165L1: RC[OC] K[.3] ; SET THE LOOP COUNT
U 13B3, 0800,003C,0180,0A00,0000,13B4 :3274 D R[0] ; GET THE CES DATA
U 13B4, 0000,003C,3180,3C00,0000,10E8 :3275 ID[CES]_D ; LOAD THE ARITH TRAP CODE
U 10E8, 0000,003D,0180,0800,0000,1181 :3276 =0 ERLOOP
U 10E9, 0000,003C,0180,0800,0000,10EA :3277 NOP
U 10EA, 2003,003D,0180,0800,4200,119D :3278 =0 ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10EB, 0810,0038,0180,0970,0000,10EC :3279 D R[OE]
U 10EC, 0000,003D,0180,0800,0000,119C :3280 =0 CALL,J/CALL3 ; EXECUTE THE A FORK

```

U 10ED, 001D, A000, 0180, 0800, 0010, 13B5	:3281		ALU_Q-D, CLK.UBCC, BYTE	: CHECK THE ADDRESS
U 13B5, 0000, 013C, 0180, 0800, 0000, 10EE	:3282		Z?	
U 10EE, 0001, 203D, 0180, 09E8, 0000, 1184	:3283	=0	ERROR2, RC[0D]_Q	: SERVICE BITS INCORRECT
U 10EF, 0800, 003C, 0180, 0A00, 0000, 13B6	:3284		D_RC[0]	: GET CES DATA
U 13B6, 0500, 003C, 0180, 0800, 0000, 13B7	:3285		D-D, LEFT	: GENERATE NEXT DATA PATTERN
U 13B7, 0001, 003C, 0180, 0A80, 0000, 13B8	:3286		R[0] D	
U 13B8, 0810, 0038, 0180, 0960, 0000, 13B9	:3287		D_RC[0C]	
U 13B9, 0019, 8000, 0580, 09E0, 0010, 13BA	:3288		RC[0C]_D-K[.1], CLK.UBCC, BYTE	: DECREMENT THE LOOP COUNT
U 13BA, 0000, 013C, 0180, 0800, 0000, 10F0	:3289		Z?	
U 10F0, 0000, 003C, 0180, 0800, 0000, 13B3	:3290	=0	J/T165L1	: CONTINUE
U 10F1, 0000, 003C, 0180, 0800, 0000, 10F2	:3291		NOP	
	:3292			

```

3293 PAGE "TEST 166 HALT PENDING BIT"
3294 *****
3295 ++
3296
3297 TEST 166 HALT PENDING (HP) BIT
3298
3299 TEST DESCRIPTION
3300 THIS TEST CHECKS THAT THE HALT PENDING BIT SETS AND CLEARS
3301 CORRECTLY AND THAT IT CONTROLS THE INSTRUCTION BUFFER SERVICE
3302 BITS CORRECTLY. THIS IS DONE BY SETTING OR CLEARING THE HP BIT
3303 AND EXECUTING THE SUB/SPEC FUNCTION IN THE IB AND CHECKING THAT
3304 THE CORRECT ADDRESS IS ASSERTED.
3305
3306 SUBTST 1 - CHECK THAT THE HP BIT IS SET WITH THE HALT REQ
3307 FROM THE CONSOLE DURING AN INTERRUPT ACK AND THE
3308 IB IS IN A STALL.
3309 SUBTST 2 -CHECKS THAT THE HP BIT CLEARS WHEN A
3310 CONSOLE CONTINUE FUNCTION IS EXECUTED.
3311 SUBTST 3 - CHECK THAT THE HP BIT CLEARS WHEN LOADED WITH THE HALT
3312 REQ BIT AND THE HALT REQ BIT IS CLEAR.
3313 THESE THREE SUBTESTS IMPLICITLY CHECKS THAT THE HP BIT IS LOADED
3314 WITH ITSELF DURING AN IRD STATE AND THE IB IS STALLING.
3315 SUBTST 4 - CHECK THAT THE HP BIT IS LOADED WITH THE HALT REQ BIT
3316 FROM THE CONSOLE WHEN THE IB IS NOT DOING A STALL.
3317 SUBTST 5 - CHECK THAT THE HP BIT IS LOADED WITH ITSELF WHEN AN
3318 INTERRUPT ACK IS ISSUED AND THE IB IS NOT STALLING.
3319
3320 LOGIC DESCRIPTION
3321 THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE HP BIT ON THE ICL
3322 MODULE, AND THE MULTIPLEXOR SELECT LINE FOR THE IB SERVICE BITS. IT
3323 ALSO CHECKS THAT THE SERVICE SIGNAL ASSERTS WHEN HP IS TRUE.
3324
3325 ERROR DESCRIPTION
3326 DATA: EXPECTED MICRO PC BITS <7:0>
3327 RECEIVED MICRO PC BITS <7:0>
3328
3329 NOTE: THE EXPECTED DATA SHOULD EITHER BE 34 OR 62 DEPENDING ON
3330 WHETHER THE HP BIT IS SET OR CLEAR.
3331
3332 SYNC POINT DESCRIPTION
3333 ADDRESS SYNC00--MICRO PC BITS ARE ASSERTED AT THE INSTRUCTION AFTER
3334 THIS INSTRUCTION. HP BIT SHOULD LOAD WITH ITSELF
3335 DURING THIS INSTRUCTION.
3336 SUBTST 1 - SYNC20--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
3337 SUBTST 2 - SYNC21--MUX SHOULD BE DISABLED THAT FEEDS HP BIT
3338 SUBTST 3 - SYNC22--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
3339 SUBTST 4 - SYNC23--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
3340 SYNC24--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
3341 SUBTST 5 - SYNC25--HP BIT IS LOADED FROM ITSELF.
3342 SYNCB6--HP IS LOADED FROM ITSELF.
3343
3344 --
3345 *****
3346 =0
3347 T166: NEWTST[.2]
R[0]_K[.34] ; GEN ADDRESS OF IB DISPATCH

```



```

:3348
U 10F4, 0000,003D,0180,0800,0000,11A4 :3349
U 10F5, 0818,0038,A580,0800,0000,138B :3350
U 138B, 0019,0014,0980,0A90,0000,138C :3351
U 138C, 0003,003C,0180,0A88,0000,10F6 :3352
:3353
:3354
:3355
:3356
:3357
:3358
:3359
U 10F6, 0018,0039,4580,0AD0,0000,118E :3360
U 10F7, 2000,003C,0180,0A00,0000,10F8 :3361
U 10F8, 0000,003D,0180,0800,0000,1189 :3362
U 10F9, 0000,003C,0180,09F0,0000,10FA :3363
U 10FA, 0000,003D,0180,0800,0000,1181 :3364
U 10FB, 0810,0038,0180,0970,9000,10FC :3365
U 10FC, 0000,003D,0180,0800,0000,119C :3366
U 10FD, 001D,A000,0180,0800,0010,13BD :3367
U 13BD, 0000,013C,0180,0800,0000,10FE :3368
U 10FE, 0001,203D,0180,09E8,0000,1184 :3369
:3370
:3371
:3372
:3373
:3374
:3375
U 10FF, 0000,003C,0180,0A10,0000,110A :3376
U 110A, 0000,003D,0180,0800,0000,1189 :3377
U 110B, 0000,003C,0180,09F0,0000,1110 :3378
U 1110, 0000,003D,0180,0800,0000,1181 :3379
U 1111, 0000,003C,0180,0800,0000,1112 :3380
U 1112, 0000,003D,0180,0800,0000,100A :3381
U 1113, 0000,003C,0180,0800,0000,1114 :3382
U 1114, 0018,0039,4580,0AD0,0000,118E :3383
U 1115, 0810,0038,0180,1D70,9000,1116 :3384
U 1116, 0000,003D,0180,0800,0000,119C :3385
U 1117, 001D,A000,0180,0800,0010,13BE :3386
U 13BE, 0000,013C,0180,0800,0000,1118 :3387
U 1118, 0001,203D,0180,09E8,0000,1184 :3388
:3389
:3390
:3391
:3392
:3393
:3394
U 1119, 0000,003C,0180,0A10,0000,111A :3395
U 111A, 0000,003D,0180,0800,0000,1189 :3396
U 111B, 0000,003C,0180,09F0,0000,111C :3397
U 111C, 0018,0039,1980,0AD0,0000,118E :3398
U 111D, 0000,003C,0180,0800,0000,111E :3399
U 111E, 0000,003D,0180,0800,0000,1181 :3400
U 111F, 0000,003C,0180,0800,0000,1120 :3401
U 1120, 0000,003D,0180,0800,0000,100A :3402

=0 CALL,J/UNJAM ; WHEN THE SERVICE SIGNAL IS TRUE
D,K[.60] ; CLEAR ANY SBI INTERRUPTS
R[2],D+K[.2] ; GENERATE ADR OF IB DISPATCH
R[1],0 ; WHEN THE SERVICE SIGNAL IS FALSE
; SET ADDRESS OF IB DATA

:////////////////////
: HP_HALT REQ => STALL+SVC * IACK
:-

=0
T166S1: SETMCR[.8000] ; SET THE HALT REQ BIT IN THE CONSOLE
IBC/FLUSH,LAB_R[0] ; ASSERT STALL+SVC
=0 SUBTEST
RC[OE],LA ; GET EXPECTED IB ADDRESS
=0 ERLOOP
SYNC20: INTRPT.ACK,MSC/IRD,D_RC[OE] ; EXECUTE THE TEST
=0 CALL,J/CALL3 ; GET THE IB MICRO PC BITS
ALU_Q-D,CLK.UBCC,BYTE ; CHECK
Z?
=0 ERROR2,RC[OD],Q ; HP DID NOT SET OR SERVICE MUX FAILED

:////////////////////
: CHECK THAT THE HP BIT CLEARS WHEN A CONSOLE CONTINUE FUCTION IS EXECUTED
:-

T166S2: LAB_R[2]
=0 SUBTEST
RC[OE],LA ; GET EXPECTED IB ADDRESS
=0 ERLOOP
NOP
=0 CALL,J/SETHP ; SET THE HALT PENDING BIT
NOP
=0 SETMCR[.8000] ; SET THE HALT REQ SIGNAL
SYNC21: CID/CONT,MSC/IRD,INTRPT.ACK,D_RC[OE] ; EXECUTE THE TEST
=0 CALL,J/CALL3 ; GET THE IB ADDRESS
ALU_Q-D,CLK.UBCC,BYTE ; CHECK IT
Z?
=0 ERROR2,RC[OD],Q ; HP DID NOT CLEAR

:////////////////////
: NOW CHECK THAT THE HP BIT CLEARS WHEN THE HALT REQ SIGNAL IS FALSE.
:-

T166S3: LAB_R[2]
=0 SUBTEST
RC[OE],LA ; GET THE EXPECTED DATA
=0 SETMCR[ZERO] ; CLEAR THE HALT REQ BIT
NOP
=0 ERLOOP
NOP
=0 CALL,J/SETHP ; SET THE HP BIT

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U 1121, 0810,0038,0180,0970,9000,1122 :3403
U 1122, 0000,003D,0180,0800,0000,119C :3404
U 1123, 001D,A000,0180,0800,0010,13BF :3405
U 13BF, 0000,013C,0180,0800,0000,1124 :3406
U 1124, 0001,203D,0180,09E8,0000,1184 :3407
:3408
:3409
:3410
:3411
:3412
:3413
U 1125, 0000,003C,0180,0A00,0000,1126 :3414
U 1126, 0000,003D,0180,0800,0000,1189 :3415
U 1127, 0000,003C,0180,09F0,0000,1128 :3416
U 1128, 0018,0039,4580,0AD0,0000,118E :3417
U 1129, 0000,003C,0180,0800,0000,112A :3418
U 112A, 2000,003D,0180,0A08,4200,119D :3419
U 112B, 0000,003C,0180,0800,0000,112C :3420
U 112C, 0000,003D,0180,0800,0000,1181 :3421
U 112D, 0000,003C,0180,1C00,0000,13C0 :3422
U 13C0, 0810,0038,0180,0970,1000,112E :3423
U 112E, 0000,003D,0180,0800,0000,119C :3424
U 112F, 001D,A000,0180,0800,0010,13C1 :3425
U 13C1, 0000,013C,0180,0800,0000,1130 :3426
U 1130, 0001,203D,0180,09E8,0000,1184 :3427
:3428
:3429
:3430
:3431
:3432
U 1131, 0000,003C,0180,0A10,0000,13C2 :3433
U 13C2, 0000,003C,0180,09F0,0000,1132 :3434
U 1132, 0000,003D,0180,0800,0000,1181 :3435
U 1133, 0000,003C,0180,0800,0000,1134 :3436
U 1134, 0000,003D,0180,0800,0000,100A :3437
U 1135, 0000,003C,0180,0800,0000,1136 :3438
U 1136, 2000,003D,0180,0A08,4200,119D :3439
U 1137, 0000,003C,0180,0800,0000,13C3 :3440
U 13C3, 0810,0038,0180,0970,1000,13C4 :3441
U 13C4, 2000,003C,0180,0800,0000,1138 :3442
U 1138, 0000,003D,0180,0800,0000,119C :3443
U 1139, 001D,A000,0180,0800,0010,13C5 :3444
U 13C5, 0000,013C,0180,0800,0000,113A :3445
U 113A, 0001,203D,0180,09E8,0000,1184 :3446
:3447
:3448
:3449
:3450
:3451
:3452
U 113B, 0000,003C,0180,0A10,0000,113C :3453
U 113C, 0000,003D,0180,0800,0000,1189 :3454
U 113D, 0000,003C,0180,09F0,0000,113E :3455
U 113E, 0000,003D,0180,0800,0000,1181 :3456
U 113F, 0000,003C,0180,0800,0000,1140 :3457

```

```

SYNC22: INTRPT.ACK, MSC/IRD, D_RC[OE] ; EXECUTE THE TEST
=0 CALL, J/CALL3 ; GET THE IB MICRO PC BITS
ALU_Q-D, CLK.UBCC, BYTE ; CHECK THEM
Z?
=0 ERROR2, RC[OD]_Q ; HP BIT DID NOT CLEAR

:////////////////////
: HP_HALT REQ => -(STALL+SVC) * IRD STATE
:-
T166S4: LAB R[0]
=0 SUBTEST
RC[OE]_LA ; GET THE EXPECTED IB ADDRESS
=0 SETMCR[.8000] ; SET THE HALT REQ BIT
NOP
=0 ALU_R[1], FLUSH.IB, CALL, J/IBWAIT ; LOAD THE IB
NOP
=0 ERLOOP
CID/CONT ; CLEAR THE HP BIT
SYNC23: MSC/IRD, D_RC[OE] ; EXECUTE THE TEST, SET HP BIT
=0 CALL, J/CALL3 ; GET IB MICRO PC BITS
ALU_Q-D, CLK.UBCC, BYTE ; CHECK
Z?
=0 ERROR2, RC[OD]_Q ; HP BIT DID NOT SET

: +
: NOW CHECK THAT THE HP BIT CLEARS WHEN HALT REQ IS CLEAR
:-
LAB R[2]
RC[OE]_LA ; GET EXPECTED IB ADDRESS
=0 ERLOOP
NOP
=0 CALL, J/SETHP ; SET THE HP BIT
NOP
=0 ALU_R[1], FLUSH.IB, CALL, J/IBWAIT ; LOAD THE IB
IBC7CLR.1 ; GET OUT OF EXEC POINT 0
SYNC24: MSC/IRD, D_RC[OE] ; EXECUTE THE TEST, HP CLEARS
IBC/FLUSH ; ASSERT STALL+SVC
=0 CALL, J/CALL3 ; GET MICRO PC BITS
ALU_Q-D, CLK.UBCC, BYTE ; CHECK
Z?
=0 ERROR2, RC[OD]_Q ; HP BIT DID NOT CLEAR

:////////////////////
: HP_HP => -(STALL+SVC) * IACK * IRD STATE
: +
T166S5: LAB R[2]
=0 SUBTEST
RC[OE]_LA ; GET EXPECTED IB ADDRESS
=0 ERLOOP
NOP

```

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```

U 1140, 2000,003D,0180,0A08,4200,119D :3458
U 1141, 0F00,003C,0180,1C00,0000,13C6 :3459
U 13C6, 0000,003C,0180,3C00,9000,13C7 :3460
U 13C7, 2810,0038,0180,0970,0000,1142 :3461
U 1142, 0000,003D,0180,0800,0000,119C :3462
U 1143, 001D,A000,0180,0800,0010,13C8 :3463
U 13C8, 0000,013C,0180,0800,0000,1144 :3464
U 1144, 0001,203D,0180,09E8,0000,1184 :3465
      :3466
      :3467
      :3468
      :3469
      :3470
U 1145, 0000,003C,0180,0A00,0000,13C9 :3471
U 13C9, 0000,003C,0180,09F0,0000,1146 :3472
U 1146, 0000,003D,0180,0800,0000,1181 :3473
U 1147, 0000,003C,0180,0800,0000,1148 :3474
U 1148, 0000,003D,0180,0800,0000,100A :3475
U 1149, 0000,003C,0180,0800,0000,114A :3476
U 114A, 2000,003D,0180,0A08,4200,119D :3477
U 114B, DF00,003C,0180,0800,0000,13CA :3478
U 13CA, 0810,0038,0180,3D70,9000,13CB :3479
U 13CB, 2000,003C,0180,0800,0000,114C :3480
U 114C, 0000,003D,0180,0800,0000,119C :3481
U 114D, 001D,A000,0180,0800,0010,13CC :3482
U 13CC, 0000,013C,0180,0800,0000,114E :3483
U 114E, 0001,203D,0180,09E8,0000,1184 :3484
U 114F, 0000,003C,0180,1C00,0000,1150 :3485
      :3486
      :3487
      :3488
      :3489
      :3490
      :3491
      :3492

```

```

=0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
      CID7CONT,D 0 ; CLEAR THE HP BIT
SYN25: MSC/IRD,INTRPT.ACK,ID[IBUF]_D ; EXECUTE THE TEST
      IBC/FLUSH,D_RC[OE] ; ASSERT STALL+SVC
=0      CALL,J/CALL3 ; GET MICRO PC BITS
      ALU_Q-D,CLK.UBCC,BYTE ; CHECK
      Z?
=0      ERROR2,RC[OD]_Q ; HP DID NOT REMAIN CLEAR

;+
; NOW CHECK THAT HP_HP WHEN THE HP IS INITIALLY SET
;-

      LAB_R[0]
      RC[OE]_LA ; GET EXPECTED IB ADDRESS
=0      ERLOOP
      NOP
=0      CALL,J/SETHP ; SET THE HP BIT
      NOP
=0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
      IBC7CLR.1,D 0 ; GO TO EXEC POINT 1
SYN26: MSC/IRD,INTRPT.ACK,ID[IBUF]_D,D_RC[OE] ; EXECUTE THE TEST
      IBC/FLUSH ; ASSERT STALL+SVC
=0      CALL,J/CALL3 ; GET THE MICRO PC BITS
      ALU_Q-D,CLK.UBCC,BYTE ; CHECK
      Z?
=0      ERROR2,RC[OD]_Q ; HP DID NOT REMAIN SET
      CID/CONT ; CLEAR THE HP BIT

```

```

; THE FOLLOWING IS THE IB DATA FOR THIS TEST
;X 0
;$ 6090,0050

```



```

:3493 .PAGE 'TEST 167 PC REGISTER INCREMENT BY 'N' WITH 'SAVE' ACTIVE'
:3494 *****
:3495 ++
:3496 TEST 167 PC REGISTER INCREMENT BY 'N' WITH 'SAVE' ACTIVE
:3497
:3498 TEST DESCRIPTION
:3499 THIS TEST CHECKS THAT "SAVE" DISABLES THE CONSTANTS THAT ARE USED
:3500 TO INCREMENT THE PC WITH A PC GETS PC+N FUNCTION.
:3501 FIRST THE PSL TP BIT IS SET TO ACTIVATE THE IB STALL, THEN
:3502 THE IB IS LOADED WITH THREE DIFFERENT SPECIFIERS, THE PC IS CLEARED
:3503 THE PC IS THEN INCREMENTED BY THE IB DISPLACEMENT AND READ INTO
:3504 THE Q REGISTER AND CHECKED.
:3505
:3506 SUBTEST 1 - CHECK THAT THE INCREMENT IS NOT DISABLED IF A CALL3
:3507 IS NOT EXECUTED SIMULTANEOUSLY WITH THE PC_PC+N.
:3508
:3509 SUBTEST 2 - CHECK THAT THE INCREMENT IS DISABLED WHEN "SRV+INV"
:3510 IS TRUE.
:3511
:3512 LOGIC DESCRIPTION
:3513 THIS TEST CHECKS THAT THE SIGNALS 'DELTA PC 0', 'DELTA PC 1', AND
:3514 'DELTA PC 2', FROM THE IDP MODULE, ARE DISABLED DURING AN IB STALL.
:3515
:3516 ERROR DESCRIPTION
:3517 DATA: EXPECTED VALUE OF THE PC REGISTER
:3518 RECEIVED VALUE OF THE PC REGISTER
:3519
:3520 SYNC POINT DESCRIPTION
:3521 ADDRESS SYNCPE--DELTA PC SIGNALS ARE ADDED TO PC
:3522 --
:3523 *****
:3524 =0
U 1150, 0018,0039,0980,09F8,0000,116D :3525 T167: NEWTST[.2]
U 1151, 0000,003C,0180,0800,0000,1152 :3526 NOP
:3527 =0 R[1],K[.8], ; SET ADR OF IB DATA
:3528 CALL[UNJAM] ; CLEAR ANY SBI INTERRUPTS
:3529
:3530 //////////////////////////////////////
:3531 +
:3532 START THE TEST
:3533 --
:3534
:3535 D_K[.40]
:3536 D-D.SWAP ; GENERATE DATA TO SET TP BIT
:3537 IB[PSL]_D ; SET THE TP BIT IN THE PSL
:3538 =0 SUBTEST
:3539 RC[OE]_0+K[.4]+1 ; SET THE EXPECTED DATA
:3540 =0 ERLOOP
:3541 NOP
:3542 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
:3543 ALU_0(K),VA ALU ; LOAD THE VA
:3544 PC_VA,D_RC[OE] ; LOAD THE PC
:3545 PC_PC+N ; EXECUTE THE TEST
:3546 Q_PC ; READ THE PC
:3547 ALU_Q-D,CLK.UBCC ; CHECK THE PC
  
```

U 1150, 0018,0039,0980,09F8,0000,116D
 U 1151, 0000,003C,0180,0800,0000,1152
 U 1152, 0018,0039,0180,0A88,0000,11A4

U 1153, 0818,0038,3180,0800,0000,13CD
 U 13CD, 0800,003C,0180,0800,0000,13CE
 U 13CE, 0000,003C,3D80,3C00,0000,1156
 U 1156, 0000,003D,0180,0800,0000,1189
 U 1157, 001B,0010,1180,09F0,0000,1158
 U 1158, 0000,003D,0180,0800,0000,1181
 U 1159, 0000,003C,0180,0800,0000,115A
 U 115A, 2000,003D,0180,0A08,4200,119D
 U 115B, 0018,0038,1980,0800,0200,13CF
 U 13CF, 0810,0038,0180,0971,0000,13D0
 U 13D0, 0000,003C,0180,0807,0000,13D1
 U 13D1, 0014,0038,01C0,0800,0000,13D2
 U 13D2, 001D,2000,0180,0800,0010,13D3


```

U 13D3, 0000,013C,0180,0800,0000,115C :3548
U 115C, 0001,203D,0180,09E8,0000,1184 :3549 =0 Z? ; BRANCH IF OK
:3550 ERROR2,RC[0D]_Q
:3551
:3552 :////////////////////
:3553 :+
:3554 : NOW CHECK IT WITH THE CALL3 SIGNAL ACTIVE
:3555 :-
:3556
U 115D, 0018,0038,0D80,09E0,0000,13D4 :3557 T167S2: RC[0C]_K[.3] ; SET THE LOOP COUNT
U 13D4, 0818,0038,3180,0800,0000,13D5 :3558 D_K[.40]
U 13D5, 0800,003C,0180,0800,0000,13D6 :3559 D_D.SWAP ; GENERATE DATA TO SET TP BIT
U 13D6, 0000,003C,3D80,3C00,0000,115E :3560 ID[PSL]_D ; SET THE TP BIT IN THE PSL
U 115E, 0000,003D,0180,0800,0000,1189 :3561 =0 SUBTEST
U 115F, 0003,003C,0180,09F0,0000,1160 :3562 T167L1: RC[0E]_0 ; SET THE EXPECTED DATA
U 1160, 0000,003D,0180,0800,0000,1181 :3563 =0 ERLOOP
U 1161, 0000,003C,0180,0800,0000,1162 :3564 NOP
U 1162, 2000,003D,0180,0A08,4200,119D :3565 =0 ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1163, 0018,0038,1980,0800,0200,13D7 :3566 ALU_0(K),VA,ALU ; LOAD THE VA
U 13D7, 0810,0038,0180,0971,0000,1164 :3567 PC_VA,D,RC[0E] ; LOAD THE PC
U 1164, 0000,003D,0180,0800,0000,13E0 :3568 =0 CALL,J/CALL3ANDPCINCREMENT ; GO EXECUTE THE PC_PC+N
U 1165, 0014,0038,01C0,0800,0000,13D8 :3569 Q_PC ; READ THE PC
U 13D8, 001D,2000,0180,0800,0010,13D9 :3570 ALU_Q-D,CLK.UBCC ; CHECK THE PC
U 13D9, 0000,013C,0180,0800,0000,1166 :3571 Z? ; BRANCH IF OK
U 1166, 0001,203D,0180,09E8,0000,1184 :3572 =0 ERROR2,RC[0D]_Q
U 1167, 0000,003C,0180,0A08,0000,13DA :3573 LAB R[1]
U 13DA, 0018,0014,0980,0A88,0000,13DB :3574 R[1]_LA+K[.2] ; INCREMENT ADR OF IB DATA
U 13DB, 0000,003C,0180,0A00,0000,13DC :3575 LAB R[0]
U 13DC, 0018,0014,0580,0A80,0000,13DD :3576 R[0]_LA+K[.1] ; INCREMENT ADR OF EXP DATA
U 13DD, 0810,0038,0180,0960,0000,13DE :3577 D RC[0C]
U 13DE, 0019,8000,0580,09E0,0010,13DF :3578 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 13DF, 0000,013C,0180,0800,0000,1168 :3579 Z?
U 1168, 0000,003C,0180,0800,0000,115F :3580 =0 J/T167L1
U 1169, 0000,003C,0180,0800,0000,13E1 :3581 J/ENDT167
:3582
:3583 : FOLLOWING IS THE IB DATA FOR THE ABOVE TEST
:3584 :% 8
:3585 :$ 9F90,8F90,C090
:3586 :
:3587
:3588 CALL3ANDPCINCREMENT:
:3589
U 13E0, 0000,003F,0180,0807,0000,1200 :3590 SYNCFE: SUB/SPEC,PC_PC+N,J/DISPATTBL ; EXECUTE THE INCREMENT PC FUNCTION
:3591
:3592 ENDT167:
U 13E1, 0000,003D,0180,0800,0000,116D :3593 ENDTST: NEWTST

```

•

Location / Line Number Index

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- DFFF Unused							
U 1000	1876=	1845	1847=	1866=	1867=	1868=	1846	3105=
U 1008	1884=	1885=	2032=	2033=	2034=	2035=	1869	3106=
U 1010	2950=	2951=	2952=	2953=	2954=	2955=	2956=	2957=
U 1018	2336=	2338=	2341=	2343=	2346=	2348=	3066=	3067=
U 1020	2423=	2431=	2434=	2435=	2436=	2437=	3124=	3125=
U 1028	2444=	2445=	2451=	2459=	2460=	2461=	3142=	3143=
U 1030	2462=	2463=	2470=	2471=	2477=	2487=	3160=	3161=
U 1038	2488=	2489=	2490=	2491=	2510=	2511=	2518=	2527=
U 1040	2528=	2529=	2530=	2531=	2532=	2533=	2539=	2540=
U 1048	2544=	2554=	2555=	2556=	2557=	2558=	1920:	1870
U 1050	2560=	2561=	2586=	2587=	2592=	2593=	2597=	2606=
U 1058	2607=	2608=	1924:	1871	2609=	2610=	1928:	1872
U 1060	2625=	2626=	2630=	2631=	2637=	2646=	2648=	2649=
U 1068	2650=	2651=	2678=	2679=	2684=	2685=	2737=	2738=
U 1070	2739=	2740=	2755=	2756=	2759=	2760=	2764=	2770=
U 1078	2771=	2772=	2777=	2783=	2786=	2787=	2792=	2798=
U 1080	2804=	2805=	2813=	2822=	2824=	2825=	2829=	2830=
U 1088	2840=	2846=	2847=	2848=	2849=	2850=	2855=	2856=
U 1090	2860=	2861=	2869=	2870=	2877=	2878=	2907=	2908=
U 1098	2917=	2918=	2919=	2920=	2921=	2922=	2924=	2931=
U 10A0	2932=	2933=	2934=	2935=	2936=	2937=	2939=	2940=
U 10A8	3042=	3043=	3046=	3047=	3059=	3060=	3064=	3065=
U 10B0	3070=	3076=	3082=	3083=	3094=	3095=	3116=	3117=
U 10B8	3120=	3121=	3122=	3123=	3128=	3135=	3136=	3137=
U 10C0	3140=	3141=	3146=	3153=	3154=	3155=	3158=	3159=
U 10C8	3164=	3165=	3210=	3211=	3212=	3219=	3220=	3221=
U 10D0	3228=	3229=	3230=	3231=	3232=	3233=	3235=	3242=
U 10D8	3243=	3244=	3247=	3248=	3249=	3250=	3251=	3252=
U 10E0	3254=	3262=	3263=	3264=	3265=	3266=	3267=	3268=
U 10E8	3276=	3277=	3278=	3279=	3280=	3281=	3283=	3284=
U 10F0	3290=	3291=	3346=	3347=	3349=	3350=	3360=	3361=
U 10F8	3362=	3363=	3364=	3365=	3366=	3367=	3369=	3376=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1873	3377=	3378=	1840:	1841:	1842:	1843:
U 1110	3379=	3380=	3381=	3382=	3383=	3384=	3385=	3386=
U 1118	3388=	3395=	3396=	3397=	3398=	3399=	3400=	3401=
U 1120	3402=	3403=	3404=	3405=	3407=	3414=	3415=	3416=
U 1128	3417=	3418=	3419=	3420=	3421=	3422=	3424=	3425=
U 1130	3427=	3433=	3435=	3436=	3437=	3438=	3439=	3440=
U 1138	3443=	3444=	3446=	3453=	3454=	3455=	3456=	3457=
U 1140	3458=	3459=	3462=	3463=	3465=	3471=	3473=	3474=
U 1148	3475=	3476=	3477=					

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2321	2322	2323	2324	2331	2332	2333	2334
U 11A8	2335	2339	2340	2344	2345	2349	2350	2432
U 11B0	2433	2438	2439	2440	2441	2442	2443	2446
U 11B8	2447	2448	2449	2450	2464	2465	2466	2467
U 11C0	2468	2469	2472	2473	2474	2475	2476	2492
U 11C8	2493	2494	2495	2500	2501	2502	2503	2504
U 11D0	2505	2508	2509	2512	2513	2514	2515	2516
U 11D8	2517	2534	2535	2536	2537	2538	2541	2542
U 11E0	2543	2559	2562	2563	2564	2572	2573	2574
U 11E8	2575	2576	2577	2578	2579	2582	2583	2584
U 11F0	2585	2588	2589	2590	2591	2594	2595	2596
U 11F8	2611	2612	2613	2614	2615	2616	2617	2618
U 1200	2052:	2053:	2054:	2055:	2056:	2057:	2058:	2059:
U 1208	2060:	2061:	2062:	2063:	2064:	2065:	2066:	2067:
U 1210	2068:	2069:	2070:	2071:	2072:	2073:	2074:	2075:
U 1218	2076:	2077:	2078:	2079:	2080:	2081:	2082:	2083:
U 1220	2084:	2085:	2086:	2087:	2088:	2089:	2090:	2091:
U 1228	2092:	2093:	2094:	2095:	2096:	2097:	2098:	2099:
U 1230	2100:	2101:	2102:	2103:	2104:	2105:	2106:	2107:
U 1238	2108:	2109:	2110:	2111:	2112:	2113:	2114:	2115:
U 1240	2116:	2117:	2118:	2119:	2120:	2121:	2122:	2123:
U 1248	2124:	2125:	2126:	2127:	2128:	2129:	2130:	2131:
U 1250	2132:	2133:	2134:	2135:	2136:	2137:	2138:	2139:
U 1258	2140:	2141:	2142:	2143:	2144:	2145:	2146:	2147:
U 1260	2148:	2149:	2150:	2151:	2152:	2153:	2154:	2155:
U 1268	2156:	2157:	2158:	2159:	2160:	2161:	2162:	2163:
U 1270	2164:	2165:	2166:	2167:	2168:	2169:	2170:	2171:
U 1278	2172:	2173:	2174:	2175:	2176:	2177:	2178:	2179:
U 1280	2180:	2181:	2182:	2183:	2184:	2185:	2186:	2187:
U 1288	2188:	2189:	2190:	2191:	2192:	2193:	2194:	2195:
U 1290	2196:	2197:	2198:	2199:	2200:	2201:	2202:	2203:
U 1298	2204:	2205:	2206:	2207:	2208:	2209:	2210:	2211:
U 12A0	2212:	2213:	2214:	2215:	2216:	2217:	2218:	2219:
U 12A8	2220:	2221:	2222:	2223:	2224:	2225:	2226:	2227:
U 12B0	2228:	2229:	2230:	2231:	2232:	2233:	2234:	2235:
U 12B8	2236:	2237:	2238:	2239:	2240:	2241:	2242:	2243:
U 12C0	2244:	2245:	2246:	2247:	2248:	2249:	2250:	2251:
U 12C8	2252:	2253:	2254:	2255:	2256:	2257:	2258:	2259:
U 12D0	2260:	2261:	2262:	2263:	2264:	2265:	2266:	2267:
U 12D8	2268:	2269:	2270:	2271:	2272:	2273:	2274:	2275:
U 12E0	2276:	2277:	2278:	2279:	2280:	2281:	2282:	2283:
U 12E8	2284:	2285:	2286:	2287:	2288:	2289:	2290:	2291:
U 12F0	2292:	2293:	2294:	2295:	2296:	2297:	2298:	2299:
U 12F8	2300:	2301:	2302:	2303:	2304:	2305:	2306:	2307:
U 1300	2619	2620	2621	2622	2623	2624	2627	2628
U 1308	2629	2632	2633	2634	2635	2636	2647	2652
U 1310	2653	2654	2655	2656	2659	2660	2661	2662
U 1318	2663	2664	2665	2666	2667	2668	2669	2670
U 1320	2671	2672	2674	2675	2676	2677	2680	2681
U 1328	2682	2683	2741	2742	2743	2744	2745	2746
U 1330	2747	2754	2757	2758	2761	2762	2763	2773
U 1338	2774	2775	2776	2784	2785	2788	2789	2790
U 1340	2791	2799	2800	2801	2802	2803	2806	2807

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 1348	2808	2809	2810	2811	2812	2823	2826	2827
U 1350	2828	2831	2832	2833	2834	2835	2836	2837
U 1358	2838	2839	2851	2852	2853	2854	2857	2858
U 1360	2859	2862	2863	2864	2865	2866	2867	2868
U 1368	2871	2872	2873	2874	2875	2876	2909	2923
U 1370	2938	2941	2949	2958	2963	3044	3045	3048
U 1378	3049	3050	3051	3058	3061	3062	3063	3068
U 1380	3069	3077	3078	3079	3080	3081	3084	3085
U 1388	3086	3087	3088	3089	3090	3091	3092	3093
U 1390	3101	3102	3103	3104	3114	3115	3118	3119
U 1398	3126	3127	3138	3139	3144	3145	3156	3157
U 13A0	3162	3163	3166	3167	3168	3222	3223	3224
U 13A8	3225	3226	3227	3234	3245	3246	3253	3269
U 13B0	3270	3271	3273	3274	3275	3282	3285	3286
U 13B8	3287	3288	3289	3351	3352	3368	3387	3406
U 13C0	3423	3426	3434	3441	3442	3445	3460	3461
U 13C8	3464	3472	3479	3480	3483	3536	3537	3544
U 13D0	3545	3546	3547	3548	3558	3559	3560	3567
U 13D8	3570	3571	3574	3575	3576	3577	3578	3579
U 13E0	3590	3593						
U 13E8 - 13EF	Unused							
U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

CCCCCCCCCCCCCCCC

22-ESKAM-V132 Line Number Index
ESKAM3B.MCR

MICRO2 1M(01)

16-DEC-82 12:39:56

8 14

SEQ 1196
Page 9

Words not
in bounds

ESK00DEF	0
ESK00MAC	0
ESKAMMAC	0
ESKAM3B	1010

Used	1010
Remaining	

Total microwords used in memory U: 1010

Total microwords remaining in memory U: 0

Highest address used in memory U: 13FF (hex)

ZZ-ESKAH-V132 Line Number Index
ESKAH3B.MCR

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C 14

SEQ 1197
Page 9

; The files used in this assembly are:

ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH3B.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0

: 3	Control ROM Field Definitions
: 548	Register Transfer Macro Definitions
: 1413	Non-transfer Functions
: 1485	Branch Enable Macro Definitions
: 1564	MICRO DIAGNOSTIC DEFINED MACROS
: 2110	TEST 168 CES REGISTER BITS <11:0> DATA INTEGRITY FROM THE ID BUS
: 2211	TEST 169 CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD=1
: 2386	TEST 16A CES REGISTER ALU N BIT
: 2588	TEST 16B CES REGISTER BITS <15:12> (CS PARITY ERROR)
: 2690	TEST 16C RECEIVER AND INTERVAL TIMER INTERRUPTS
: 2873	TEST 16D CONSOLE INTERRUPT DISABLE
: 3041	TEST 16E ID BUS 'ATEMP' REGISTERS
: 3200	TEST 16F ID BUS 'BTEMP' REGISTERS

ZZ-ESKAH-V132 Subroutines
ESKAH3C.MCR

MICRO2 1M(01) 16-DEC-82 12:42:53

E 14

SEQ 1199
Page

:1
:1804 .NOLIST
:1805 .LIST

0000000000
0000000000


```

:1806
:1807
:1808
:1809
:1810
:1811
:1812
:1813
:1814
:1815
:1816
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:1860

```

.REGION/1000,13FF

* FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
 WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
 R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
 THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
 THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.

FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
 6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
 ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
 R[OF] AND DO A RETURN0.

IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
 READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
 TO THE CONSOLE.

THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
 ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
 EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
 RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
 STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.

1100:	SC_K[ZERO],Q_R[OF],J/TRPH0	: SYSTEM INIT
1101:	SC_K[.1],Q_R[OF],J/TRPH0	: DATA UNALIGNED
1102:	SC_K[.2],Q_R[OF],J/TRPH0	: X PAGE ERROR
1103:	SC_K[.3],Q_R[OF],J/TRPH0	: TB MODIFY
1104:	SC_K[.4],Q_R[OF],J/TRPH0	: TB PROT ERROR
1105:	SC_K[.6],Q_R[OF],J/TRPH0	: TB MISS
1106:	SC_K[.9],Q_R[OF],J/TRPH0	: RES FLOAT OPER
1107:	SC_K[.7],Q_R[OF],J/TRPH0	: TB PARITY
1108:	SC_K[.8],Q_R[OF],J/TRPH0	: CACHE PARITY
110C:	SC_K[.C],Q_R[OF],J/TRPH0	: RDS
110D:	SC_K[.D],Q_R[OF],J/TRPH0	: TIME OUT
110E:	SC_K[.10],Q_R[OF],J/TRPH0	: ODD ADDRESS
110F:	SC_K[.F],Q_R[OF],J/TRPH2	: CS PARITY

TRPH0: ALU_Q.ANDNOT.MASK,CLK.UBCC : WAS TRAP EXPECTED?
 Z? : BRANCH IF NO
 =0 ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 : CLEAR THE BIT AND RETURN

* THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
 IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
 FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:

DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
 TRAP CODE--INDICATES WHICH TRAP OCCURRED
 FAULT STATUS REGISTER
 SBI ERROR REGISTER
 TIMEOUT ADDRESS REGISTER
 MAINTENANCE REGISTER

U	1003.	0018.	0038.	1D80.	09E8.	0000.	1004
U	1004.	0000.	003D.	D980.	0800.	0084.	716B
U	1005.	0000.	003C.	49F0.	2C00.	0000.	1083
U	1083.	0001.	203C.	4DF0.	2DB0.	0000.	1093
U	1093.	0001.	203C.	65F0.	2DB8.	0000.	1109
U	1109.	0001.	203C.	6DF0.	2DD8.	0000.	1134
U	1134.	0001.	203C.	75F0.	2DE0.	0000.	1135
U	1135.	0001.	203C.	79F0.	2DC8.	0000.	1136
U	1136.	0001.	203C.	69F0.	2DC0.	0000.	1137
U	1137.	0001.	203C.	81F0.	2DD0.	0000.	1000
U	1000.	0001.	203D.	0180.	09F0.	0000.	114F

```

:      CACHE PARITY REGISTER
:      TB ERROR REGISTER 1
:      TB ERROR REGISTER 0

```

```
TRPH1:    RC[0D] SC
          =0    SETRCF[.9]
              Q ID[TBER0]
              RC[6] Q,Q ID[TBER1]
              RC[7] Q,Q ID[SBI.ERR]
              RC[0B] Q,Q ID[FAULT]
              RC[0C] Q,Q ID[MAINT]
              RC[9] Q,Q ID[PARITY]
              RC[8] Q,Q ID[TIME.ADDR]
              RC[0A] Q,Q ID[USTACK]
1000:    RC[0E] Q,ERROR1
```

```

: +
: THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.

```

```
U 1138. 0001.2024.0180.0800.0010.1139
U 1139. 0000.013C.0180.0800.0000.1006
U 1006. 0001.2036.0180.0AF8.0000.0001
U 1007. 0000.003C.0180.0800.0000.1003
```

```

TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
        Z?                               ; BRANCH IF NO
=0      ALU_Q[AND]MASK,R[OF]_ALU,RETURN1 ; RETURN
        J/TRPH1                          ; REPORT UNEXPECTED TRAP

```

```

: 4 THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
: MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:

```

U 113A.	0000,003C,65F8,0800,0084,713B
U 113B.	0818,0038,8D80,0800,0000,113C
U 113C.	0D00,003C,0180,0800,0000,113D
U 113D.	0000,003C,3D80,3C00,0000,113E
U 113E.	0818,0038,0580,0800,0000,113F
U 113F.	0D00,003C,0180,0800,0000,1140
U 1140.	0F00,003C,3180,3C00,0000,1141
U 1141.	0000,003C,5D80,3C00,0000,1142
U 1142.	0000,003C,3980,3C00,0000,1143
U 1143.	0000,003C,2980,3C00,0000,1144
U 1144.	0000,003C,4980,3C00,0000,1145
U 1145.	0000,003C,7180,3C00,0000,1146
U 1146.	0818,0038,C180,0800,0000,1147
U 1147.	0000,003C,6580,3C00,0000,1148
U 1148.	0F00,003C,6D80,3C00,0000,1149
U 1149.	0000,003C,6D80,3C00,0000,114A
U 114A.	0000,003C,6580,3C00,0000,114B
U 114B.	0003,003C,0180,09F0,0000,114C
U 114C.	0003,003C,0180,0AF8,0000,114D

```
SCOPE: SC K[.10],Q_0 ; SETUP TO WRITE IPL OF 1F
D_R[.1F] ; ...
D-DAL.SC
ID[PSL]_D ; WRITE THE PSL
D_K[.1] ; SETUP TO CLEAR THE CES REGISTER
D-DAL.SC
ID[CES]_D,D_0 ; CLEAR THE CES REGISTER
ID[ACC.[CS]_D ; SHUT OFF THE FLOATING POINT
ID[SIR]_D ; CLEAR THE SIR REGISTER
ID[CLK.[CS]_D ; STOP INTERVAL TIMER
ID[TBERO]_D ; SHUT OFF THE TB
ID[COMP]_D ; CLEAR SILO COMPARATOR
D_K[.FFFF]
ID[SBI.ERR]_D
ID[FAULT]_D,D_0
ID[FAULT]_D
ID[SBI.ERR]_D
RC[OE]_0
RC[OF]_0
```

```

U 114D, 0003,003C,0180,09E8,0000,105E :1916
U 114E, 0818,0038,0980,0800,0000,105E :1917
U 114F, 0810,0038,0180,0978,0000,1150 :1918
U 1150, 0819,0034,4D80,0800,0000,104E :1919
U 104E, 0819,0030,1180,0800,0000,105E :1920
:1921
U 1151, 0810,0038,0180,0978,0000,1152 :1922
U 1152, 0819,0034,4D80,0800,0000,105A :1923
U 105A, 0819,0030,D580,0800,0000,105E :1924
:1925
:1926
:1927
U 105E, 0000,003C,1D80,3C00,0000,105E :1928
:1929
:1930
:1931
:1932
:1933
U 13F0, 0000,003C,0180,0800,0000,13F1 :1934
U 13F1, 0000,003C,0180,0800,0000,13F2 :1935
U 13F2, 0000,003C,0180,0800,0000,13F3 :1936
U 13F3, 0000,003C,0180,0800,0000,13F4 :1937
U 13F4, 0000,003C,0180,0800,0000,13F5 :1938
U 13F5, 0000,003C,0180,0800,0000,13F6 :1939
U 13F6, 0000,003C,0180,0800,0000,13F7 :1940
U 13F7, 0000,003C,0180,0800,0000,13F8 :1941
U 13F8, 0000,003C,0180,0800,0000,13F9 :1942
U 13F9, 0000,003C,0180,0800,0000,13FA :1943
U 13FA, 0000,003C,0180,0800,0000,13FB :1944
U 13FB, 0000,003C,0180,0800,0000,13FC :1945
U 13FC, 0000,003C,0180,0800,0000,13FD :1946
U 13FD, 0000,003C,0180,0800,0000,13FE :1947
U 13FE, 0000,003C,0180,0800,0000,13FF :1948
U 13FF, 0000,003C,0180,0800,0000,1153 :1949
:1950
:1951
:1952
:1953
:1954
:1955
:1956
:1957
:1958
:1959
:1960
:1961
:1962
:1963
:1964
:1965
U 1153, 0018,0038,1980,0800,0000,1164 :1966
U 1154, 0018,0038,1980,0800,0000,1165 :1967
U 1156, 0018,0038,1980,0800,0000,1166 :1968
U 1157, 0018,0038,1980,0800,0000,1167 :1969
U 1158, 0018,0038,0980,0800,0000,1164 :1970

```

```

RC[OD] 0,J/CALLCON ; CALL THE CONSOLE
ERLOOP: D_K[.2],J/CALLCON ; ERRLOOP CALL
ERROR1: D_RC[OF]
D_D.AND.K[.FF00]
104E: D_D.OR.K[.4],J/CALLCON
ERROR2: D_RC[OF]
D_D.AND.K[.FF00]
105A: D_D.OR.K[.6],J/CALLCON
105E:
CALLCON:
ID[TXDB]_D,J/CALLCON ; CALL THE CONSOLE

```

```

: +
: THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
: -

```

```

13F0: NOP
13F1: NOP
13F2: NOP
13F3: NOP
13F4: NOP
13F5: NOP
13F6: NOP
13F7: NOP
13F8: NOP
13F9: NOP
13FA: NOP
13FB: NOP
13FC: NOP
13FD: NOP
13FE: NOP
13FF: NOP

```

```

: +
: THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
: THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
: IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
: IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.

```

```

: FOR EXAMPLE: IF A HEX '55' IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
: THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT

```

```

:
: =0 D 0,CALL,J/DC5
: NOP
: =0 CALL,J/DC5
: -

```

```

DC0: ALU_0(K),J/S00
DC1: ALU_0(K),J/S01
DC2: ALU_0(K),J/S10
DC3: ALU_0(K),J/S11
DC4: ALU_K[.2],J/S00

```



```
U 1159, 0018,0038,0980,0800,0000,1165 :1971 DC5: ALU_K[.2],J/S01
U 115A, 0018,0038,0980,0800,0000,1166 :1972 DC6: ALU_K[.2],J/S10
U 115B, 0018,0038,0980,0800,0000,1167 :1973 DC7: ALU_K[.2],J/S11
U 115C, 0018,0038,0580,0800,0000,1164 :1974 DC8: ALU_K[.1],J/S00
U 115D, 0018,0038,0580,0800,0000,1165 :1975 DC9: ALU_K[.1],J/S01
U 115E, 0018,0038,0580,0800,0000,1166 :1976 DCA: ALU_K[.1],J/S10
U 115F, 0018,0038,0580,0800,0000,1167 :1977 DCB: ALU_K[.1],J/S11
U 1160, 0018,0038,C180,0800,0000,1164 :1978 DCC: ALU_K[.FFFF],J/S00
U 1161, 0018,0038,C180,0800,0000,1165 :1979 DCD: ALU_K[.FFFF],J/S01
U 1162, 0018,0038,C180,0800,0000,1166 :1980 DCE: ALU_K[.FFFF],J/S10
U 1163, 0018,0038,C180,0800,0000,1167 :1981 DCF: ALU_K[.FFFF],J/S11
:1982
U 1164, 0118,0038,1B80,0800,0000,1168 :1983 S00: ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 1165, 0118,0038,0B80,0800,0000,1168 :1984 S01: ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1166, 0118,0038,0780,0800,0000,1168 :1985 S10: ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1167, 0118,0038,C380,0800,0000,1168 :1986 S11: ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
:1987
U 1168, 0100,003E,0380,0800,0000,0001 :1988 SX: D_D.LEFT2,SI/7,RETURN1 ; EXIT
:1989
:1990
:1991 ;+
:1992 ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
:1993 ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[0F] AS A
:1994 ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
:1995 ; TYPING IT.
:1996 ;-
:1997
U 1169, 0810,0038,4D80,0978,0000,116A :1998 SUBTST: D_RC[0F],KMX/.FF00
U 116A, 0019,4016,4D80,09F8,0000,0001 :1999 RC[0F],D+K[.FF00],WORD,RETURN1
:2000
:2001 ;+
:2002 ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
:2003 ; LOW BYTE OF RC[0F] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
:2004 ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
:2005 ;-
:2006
U 116B, 0010,0038,01C0,0978,0000,116C :2007 SETRCF: Q_RC[0F]
U 116C, 0019,2034,4DC0,0800,0000,116D :2008 Q-Q.AND.K[.FF00]
U 116D, 0019,2032,1D80,09F8,0000,0001 :2009 RC[0F],Q.OR.SC,RETURN1
:2010
```


U 1155, 0019,2000,05C0,0800,0000,12AB
U 1300, 0000,003C,0180,0800,0000,1301
U 1301, 0000,003E,0180,0800,0000,0001
U 12AA, 0000,003C,0180,0800,0000,116E

:2011
:2012
:2013
:2014
:2015

1155: Q Q-K[.1],J/12AB
1300: NOP
1301: RETURN1
12AA: NOP

; USED TO WRITE BAD PARITY
; RETURN FROM PARITY TRAP
; ECO'D LOCATION

:2016
:2017
:2018
:2019
:2020
:2021
:2022
:2023
:2024
:2025
:2026
:2027
:2028
:2029
:2030
:2031

THE FOLLOWING ROUTINES ARE USES TO SET OR CLEAR BITS IN THE CONSOLE
REGISTERS. BYTE 0 OF THE D REGISTER MUST CONTAIN 'C', BYTE ONE OF THE
D REGISTER MUST CONTAIN THE CONSOLE REGISTER ID, I.E. 0=TXCS, 2=RXCS,
AND 4=MCR, AND THE UPPER WORD OF THE D REGISTER MUST CONTAIN THE DATA
TO SET IN THE REGISTER.

THE SUBROUTINES MUST BE CALLED WITH THE DATA TO LOAD INTO THE REGISTER
IN SCRATCH PAD R[0A].

NOTE: ONLY BIT 15, 9 AND 8 OF THE MCR REGISTER CAN BE SET OR CLEARED.
ONLY BIT 7 OF THE RXCS REGISTER CAN BE SET OR CLEARED.
BIT 7 OF THE TXCS REGISTER IS ALWAYS SET WHILE THE MICRO CODE IS RUNNING.

U 116E, 0800,003C,D980,0A50,0084,716F
U 116F, 0001,001C,0180,0AD0,0000,1170
U 1170, 0818,0038,1180,0800,0000,1171
U 1171, 0000,003C,01F8,0800,0084,7172
U 1172, 0D00,003C,0180,0800,0000,1177

:2032
:2033
:2034
:2035
:2036

SETMCR: D R[0A],SC K[.9]
R[0A] D.ORNOT.MASK
D K[.4]
SC K[.8],Q 0
D_DAL.SC,J7COMCON

; INSERT BIT 9 INTO DATA
; GET REGISTER ID
; SETUP FOR SHIFT
; SHIFT TO BYTE 1

U 1173, 0F00,003C,01F8,0800,0000,1177
U 1174, 0818,0038,0980,0800,0000,1175
U 1175, 0000,003C,01F8,0800,0084,7176
U 1176, 0D00,003C,0180,0800,0000,1177

:2037
:2038
:2039
:2040
:2041

SETTXCS:D 0,J/COMCON,Q 0
SETRXCS:D K[.2]
SC K[.8],Q 0
D_DAL.SC,J7COMCON

; SET REGISTER ID
; GET REGISTER ID
; SETUP FOR SHIFT
; PUT IN BYTE 1

U 1177, 0019,0030,8580,0AD8,0000,1178
U 1178, 0800,003C,0180,0A50,0000,1179
U 1179, 0000,003C,6580,0800,0084,717A
U 117A, 0D00,003C,0180,0A58,0000,117B
U 117B, 081C,2030,0180,0800,0000,105E

:2042
:2043
:2044
:2045
:2046
:2047

COMCON: R[0B] D.OR.K[.C]
D R[0A]
SC K[.10]
D_DAL.SC,LAB R[0B]
D_LA.OR.D,J/CALLCON

; INSERT BYTE 0 AND SAVE
; GET DATA TO PUT IN CONSOLE REG
; SETUP FOR SHIFT
; PUT IN UPPER WORD
; INSERT LOWER WORD AND CALL CONSOLE

:2048
:2049
:2050
:2051
:2052

THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE

U 117C, 0F00,003C,0180,0800,0000,117D
U 117D, 0000,003C,7580,3C00,0000,117E
U 117E, 0F00,003C,0180,8000,0000,117F
U 117F, 0019,0020,6180,8000,0010,1180
U 1180, 0000,013C,0180,8000,0000,10C3
U 1008, 0819,0014,0580,8000,0000,117F

:2053
:2054
:2055
:2056
:2057
:2058
:2059

UNJAM: D 0
ID[MAINT] D
D 0,MCT/SBI.HOLD
UNJAMO: A[U D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
Z?,MCT/SBI.HOLD ; BRANCH IF YES
=0 D_D+K[.1],MCT/SBI.HOLD,J/UNJAMO ; CONTINUE HOLDING THE BUS

U 1009, 0F00,003C,0180,8800,0000,1181
U 1181, 0019,0020,6180,8800,0010,1182
U 1182, 0000,013C,0180,8800,0000,100A
U 100A, 0819,0014,0580,8800,0000,1181

:2060
:2061
:2062
:2063
:2064

D 0,MCT/SBI.HOLD+UNJAM ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
UNJAM1: A[U D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
Z?,MCT/SBI.HOLD+UNJAM ; BRANCH IF YES
=0 D_D+K[.1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM

U 100B, 0F00,003C,0180,8000,8000,1183

:2065

D_0,MCT/SBI.HOLD,INTRPT.ACK ; ASSERT HOLD FOR 16 CYCLES

```

U 1183, 0019,0020,6180,8000,0010,1184 :2066
U 1184, 0000,013C,0180,8000,0000,100C :2067
U 100C, 0819,0014,0580,8000,0000,1183 :2068
:2069
U 100D, 0000,003C,8580,0800,0084,7185 :2070
U 1185, 0803,001C,0180,0800,4000,1186 :2071
U 1186, 0000,003E,7580,3C00,0000,0001 :2072
:2073
:2074
:2075
:2076
:2077
:2078
:2079
:2080
:2081
:2082
U 1187, 3000,003C,0180,6000,0000,1188 :2083
U 1188, 0000,003C,0180,F800,0000,1189 :2084
U 1189, 0000,003C,0180,F800,0000,118A :2085
U 118A, 0000,003C,0180,F800,0000,118B :2086
U 118B, 0000,003C,0180,F800,0000,118C :2087
U 118C, 0000,003C,0180,F800,0000,118D :2088
U 118D, 1000,003E,0180,F800,0000,0001 :2089
:2090
:2091
:2092
:2093
:2094
:2095
:2096
:2097
:2098
:2099
:2100
:2101
U 100E, 0F00,003D,0180,0800,0000,1159 :2102
U 100F, 0000,003C,0180,0800,0000,1010 :2103
U 1010, 0000,003D,0180,0800,0000,115B :2104
U 1011, 0000,003C,0180,0800,0000,1012 :2105
U 1012, 0000,003D,0180,0800,0000,1162 :2106
:2107
U 1013, 0800,003C,8180,3E20,0000,0540 :2108
:2109

```

```

UNJAM2: ALU D[XOR]K[F],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
        Z?,MCT/SBI.HOLD ; BRANCH IF YES
=0      D_D+K[1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING

        SC K[C]
        D NOT.MASK,INTRPT.STROBE
        ID[MAINT]_D,RETURN1 ; TURN OFF THE SBI

```

```

;+
; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
; CACHE REFERENCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
; IS COMPLETELY FULL OF DATA.

```

```

; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
;-

```

```

IBWAIT: LOAD.IB,IBC/START
        MCT/ALLOW.IB.READ
        MCT/ALLOW.IB.READ
        MCT/ALLOW.IB.READ
        MCT/ALLOW.IB.READ
        MCT/ALLOW.IB.READ
        MCT/ALLOW.IB.READ,IBC/STOP,RETURN1

```

```

; THE FOLLOWING ROUTINE IS USED TO INTERFACE TO THE PCS MICROCODE TO
; WRITE THE WCS DATA REGISTER. SINCE THE INSTRUCTION FOLLOWING A WRITE
; TO THE WCS DATA REGISTER CANNOT BE IN WCS, AND THE PCS INSTRUCTION
; THAT WRITES THE WCS(ADDRESS 56D) PERFORMS A 'RETURN18' THE ADDRESS
; 57E IS PUSHED ON THE MICRO STACK BEFORE JUMPING TO LOCATION 540. SINCE
; LOCATION 57E PERFORMS A 'RETURN10', THE INSTRUCTION CALLING THIS ROUTINE
; MUST BE CONSTRAINED WITH '0****'.

```

```

=0
WRITEWCS:
        D 0,CALL[DC5] ; GENERATE ADDRESS '57E'
        NOP
=0      CALL[DC7] ; ...
        NOP
=0      CALL[DC9] ; ...
        ID[USTACK]_D,D_RE[4],
        J/0540 ; GO WRITE WCS

```

```

:2110 .PAGE 'TEST 168 CES REGISTER BITS <11:0> DATA INTEGRITY FROM THE ID BUS'
:2111 *****
:2112 ++
:2113 TEST 168 CES REGISTER BITS<11:0> DATA INTEGRITY FROM ID BUS
:2114
:2115 TEST DESCRIPTION
:2116 THIS TEST FLOATS A ZERO AND A ONE THRU BITS <11:0> OF THE CES
:2117 REGISTER BY WRITING AND READING THE REGISTER ON THE ID BUS.
:2118 THE ARITHMETIC TRAP CODES (BITS<6:4>) ARE NOT TESTED AND WILL
:2119 ALWAYS APPEAR AS ZERO'S IN THE DATA TYPEOUT.
:2120
:2121 SUBTST 1 - FLOAT A ZERO THRU THE BITS
:2122 SUBTST 2 - FLOAT A 1 THRU THE BITS
:2123
:2124 LOGIC DESCRIPTION
:2125 THIS TEST CHECKS THE ID BUS INTERFACE TO BITS <11:0> OF THE CES
:2126 REGISTER ON THE ICL MODULE.
:2127
:2128 ERROR DESCRIPTION
:2129 DATA: EXPECTED CES REGISTER
:2130 RECEIVED CES REGISTER
:2131 LOOP COUNT -- INDICATES WHICH BIT IS BEING TESTED, I.E.
:2132 C= BIT 0, B= BIT 1, A= BIT 2, ETC. ALTHOUGH THE ARITHMETIC
:2133 TRAP CODE BITS ARE NOT TESTED, THE LOOP COUNT INCLUDES
:2134 THESE BITS.
:2135
:2136 SYNC POINT DESCRIPTION
:2137 SUBTST 1 - SYNCA2--CES REGISTER IS LOADED WITH THE TEST PATTERN
:2138 SYNCA3--CES REGISTER IS READ
:2139 SUBTST 2 - SYNCA4--CES REGISTER IS LOADED WITH THE TEST PATTERN
:2140 SYNC15--CES REGISTER IS READ
:2141 --
:2142 *****
:2143 =0
:2144 T168: NEWTST[.3]
:2145 NOP
:2146 =0 D_K[F],CALL,J/DC8 ; GENERATE MASK FOR LOWER 12 BITS OF CES
:2147 NOP
:2148 =0 CALL,J/DCF ;
:2149 RC[0]_D ; SAVE IN RO
:2150 =0 CALL,J/UNJAM ; CLEAR ANY SBI INTERRUPTS
:2151
:2152 ;////////////////////////////////////
:2153 ;+
:2154 ; FIRST FLOAT A ZERO THRU THE REGISTER
:2155 ;-
:2156
:2157 T168S1: D_K[.FFFFC] ; GENERATE INITIAL PATTERN
:2158 D_D+K[.2],RC[1]_ALU ; SAVE
:2159 LAB RC[0]
:2160 RC[0E]_D.AND.LA ; MASK AND SAVE AS EXPECTED DATA
:2161 =0 SUBTEST
:2162 RC[0C]_K[C] ; SET THE LOOP COUNT
:2163 =0 ERLOOP
:2164 T168L2: D_RC[1] ; GET THE PATTERN
:2165
:2166
:2167
:2168
:2169
:2170
:2171
:2172
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U 1191, 0810,0038,3180,3D70,0000,1192 :2165 SYNCA2: ID[CES] D,D RC[OE] ; LOAD THE REGISTER
U 1192, 0000,003C,31F0,2E00,0000,1193 :2166 SYNCA3: Q_ID[CES],LAB_R[0] ; READ IT BACK
U 1193, 001C,0034,01C0,0A00,0000,1194 :2167 Q-Q.AND.R[0] ; MASK THE RECEIVED PATTERN
U 1194, 001D,2000,0180,0800,0010,1195 :2168 ACU_Q-D,CLK.UBCC ; CHECK
U 1195, 0000,013C,0180,0800,0000,1020 :2169 Z?
U 1020, 0001,203D,0180,09E8,0000,1151 :2170 =0 ERROR2,RC[OD]_Q ; BIT FAILED IN CES
U 1021, 0000,003C,01C0,0A08,0000,1196 :2171 Q_R[1] ; GET THE PATTERN
U 1196, 0000,003C,03A8,0800,0000,1197 :2172 Q-Q.LEFT,SI/MUL- ; GENERATE THE NEXT PATTERN
U 1197, 0001,203C,0180,0A88,0000,1198 :2173 R[1] Q ; SAVE
U 1198, 0000,003C,0180,0A00,0000,1199 :2174 LAB_R[0]
U 1199, 001C,0034,0180,09F0,0000,119A :2175 RC[OE] Q.AND.LA ; MASK AND SAVE AS EXPECTED
U 119A, 0810,0038,0180,0960,0000,119B :2176 D_RC[0]
U 119B, 0019,8000,0580,09E0,0010,119C :2177 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 119C, 0000,013C,0180,0800,0000,1022 :2178 Z?
U 1022, 0000,003C,0180,0800,0000,101F :2179 =0 J/T168L2 ; CONTINUE
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:2181 :////////////////////
:2182 :+
:2183 : NOW FLOAT A ONE THRU THE REGISTER
:2184 :-
:2185
U 1023, 0018,0038,0580,09F0,0000,1024 :2186 T168S2: RC[OE] K[.1] ; INITIALIZE EXPECTED DATA
U 1024, 0000,003D,0180,0800,0000,1169 :2187 =0 SUBTEST
U 1025, 0018,0038,0580,0A88,0000,119D :2188 R[1] K[.1] ; INITIALIZE TEST PATTERN
U 119D, 0018,0038,8580,09E0,0000,1026 :2189 RC[OC]_K[.C] ; SET THE LOOP COUNT
U 1026, 0000,003D,0180,0800,0000,114E :2190 =0 ERLOOP
U 1027, 0800,003C,0180,0A08,0000,119E :2191 T168L1: D_R[1] ; GET THE TEST PATTERN
U 119E, 0810,0038,3180,3D70,0000,119F :2192 SYNCA4: ID[CES] D,D RC[OE] ; LOAD THE CES REGISTER
U 119F, 0000,003C,31F0,2E00,0000,11A0 :2193 SYNC15: Q_ID[CES],LAB_R[0] ; READ IT BACK
U 11A0, 001C,0034,01C0,0A00,0000,11A1 :2194 Q-Q.AND.R[0] ; MASK
U 11A1, 001D,2000,0180,0800,0010,11A2 :2195 ACU_Q-D,CLK.UBCC ; CHECK
U 11A2, 0000,013C,0180,0800,0000,1028 :2196 Z?
U 1028, 0001,203D,0180,09E8,0000,1151 :2197 =0 ERROR2,RC[OD]_Q ; BIT FAILED IN CES REGISTER
U 1029, 0800,003C,0180,0A08,0000,11A3 :2198 D_R[1] ; GET THE DATA PATTERN
U 11A3, 0500,003C,0180,0800,0000,11A4 :2199 D-D.LEFT ; GENERATE NEXT PATTERN
U 11A4, 0001,003C,0180,0A88,0000,11A5 :2200 R[1] D ; SAVE
U 11A5, 081C,2034,0180,0A00,0000,11A6 :2201 D-D.AND.R[0] ; MASK PATTERN
U 11A6, 0001,003C,0180,09F0,0000,11A7 :2202 RC[OE] D ; SAVE AS EXPECTED PATTERN
U 11A7, 0810,0038,0180,0960,0000,11A8 :2203 D_RC[0]
U 11A8, 0019,8000,0580,09E0,0010,11A9 :2204 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 11A9, 0000,013C,0180,0800,0000,102A :2205 Z?
U 102A, 0000,003C,0180,0800,0000,1027 :2206 =0 J/T168L1 ; CONTINUE
U 102B, 0000,003C,0180,0800,0000,102C :2207 NOP
:2208
:2209
:2210

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:2211 .PAGE 'TEST 169 CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD=1'
:2212 .....
:2213 **
:2214 TEST 169 CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD =1
:2215
:2216 TEST DESCRIPTION
:2217 THIS TEST CHECKS THAT BITS 11,10,8, AND 7 OF THE CES REGISTER
:2218 CAN BE SET AND CLEARED WHEN EXECUTING A CCL1 FUNCTION.
:2219
:2220 SUBTST 1 - CHECK THE ALU C BIT (BIT 7).
:2221 SUBTST 2 - CHECK THE ALU Z BIT (BIT 8).
:2222 SUBTST 3 - CHECK THE EALU Z BIT (BIT 10).
:2223 SUBTST 4 - CHECK THE EALU N BIT (BIT 11).
:2224
:2225 LOGIC DESCRIPTION
:2226 THIS TEST CHECKS THE MULTIPLEXOR FOR BITS 11,10,8, AND 7 OF THE
:2227 CES REGISTER ON THE ICL MODULE.
:2228
:2229 ERROR DESCRIPTION
:2230 DATA: EXPECTED CES REGISTER
:2231 RECEIVED CES REGISTER
:2232 LOOP COUNT - INDICATES WHETHER THE BIT SHOULD BE SET OR
:2233 CLEAR, I.E. 2= BIT SHOULD BE CLEAR, 1= BIT SHOULD BE SET
:2234
:2235 SYNC POINT DESCRIPTION
:2236 SUBTST 1 - SYNC16--CLOCK THE ALU C BIT
:2237 SUBTST 2 - SYNC17--CLOCK THE ALU Z BIT
:2238 SUBTST 3 - SYNC18--CLOCK THE EALU Z BIT
:2239 SUBTST 4 - SYNC19--CLOCK THE EALU N BIT
:2240 --
:2241 .....
:2242 =0
:2243 T169: NEWTST[.3]
:2244 R[0]_K[.80] ; MASK FOR ALU C BIT
:2245 =0 CALL J/UNJAM ; CLEAR ANY SBI INTERRUPTS
:2246 R[1]_0 ; INIT Q DATA FOR ALU CARRY
:2247 R[2]_K[.80] ; SET DATA TO INIT CES CARRY BIT
:2248 R[OE]_0 ; INIT EXPECTED DATA
:2249
:2250 :////////////////////
:2251 :+
:2252 : FIRST CHECK THE ALU C BIT
:2253 :-
:2254
:2255 =0
:2256 T169S1: SUBTEST
:2257 R[OC]_K[.2] ; SET THE LOOP COUNT
:2258 =0 ERLOOP
:2259 T169L1: Q_R[1] ; GET DATA TO CREATE CARRY
:2260 D-R[2] ; GET DATA TO INIT CES REGISTER
:2261 ID[CES]_D ; INIT THE CES REGISTER
:2262 SYNC16: ALU Q+K[.1],CLK.UBCC ; EXECUTE THE TEST
:2263 Q_ID[CES],D,R[OE] ; READ THE CARRY BIT
:2264 Q-Q.AND.K[.80] ; MASK THE CARRY BIT
:2265 ACU_Q-D,CLK.UBCC ; CHECK

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U 102C, 0018,0039,0D80,09F8,0000,113A
U 102D, 0018,0038,4180,0A80,0000,102E
U 102E, 0000,003D,0180,08C0,0000,117C
U 102F, 0003,003C,0180,0A88,0000,11AA
U 11AA, 0018,0038,4180,0A90,0000,11AB
U 11AB, 0003,003C,0180,09F0,0000,1030

U 1030, 0000,003D,0180,0800,0000,1169
U 1031, 0018,0038,0980,09E0,0000,1032
U 1032, 0000,003D,0180,0800,0000,114E
U 1033, 0000,003C,01C0,0A08,0000,11AC
U 11AC, 0800,003C,0180,0A10,0000,11AD
U 11AD, 0000,003C,3180,3C00,0000,11AE
U 11AE, 0019,2014,0580,0800,0010,11AF
U 11AF, 0810,0038,31F0,2D70,0000,11B0
U 11B0, 0019,2034,41C0,0800,0000,11B1
U 11B1, 001D,2000,0180,0800,0010,11B2

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U 11B2, 0000,013C,0180,0800,0000,1034 :2266 Z?
U 1034, 0001,203D,0180,09E8,0000,1151 :2267 ERROR2,RC[0D]_Q ; CES ALU CARRY 31 BIT FAILED
U 1035, 0018,0038,4180,09F0,0000,11B3 :2268 RC[0E]_K[.80] ; SET EXPECTED DATA
U 11B3, 0003,003C,0180,0A90,0000,11B4 :2269 R[2]_0 ; SET INITIAL DATA
U 11B4, 0818,0038,C180,0800,0000,11B5 :2270 D_K[FFFF]
U 11B5, 0802,403C,0180,0800,0000,11B6 :2271 D_D,SXT[WORD]
U 11B6, 0001,003C,0180,0A88,0000,11B7 :2272 R[1]_D ; SET DATA TO GENERATE CARRY
U 11B7, 0810,0038,0180,0960,0000,11B8 :2273 D_RC[0C]
U 11B8, 0019,8000,0580,09E0,0010,11B9 :2274 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP
U 11B9, 0000,013C,0180,0800,0000,1036 :2275 Z?
U 1036, 0000,003C,0180,0800,0000,1033 :2276 J/T169L1 ; CONTINUE
:2277
:2278
:2279 :////////////////////
:2280 :+
:2281 : NOW CHECK THE ALU=0 BIT
:2282 :-
:2283
U 1037, 0003,003C,0180,09F0,0000,1038 :2284 T169S2: RC[0E]_0 ; INIT EXPECTED DATA
U 1038, 0000,003D,0180,0800,0000,1169 :2285 =0 SUBTEST
U 1039, 0818,0038,4180,0800,0000,11BA :2286 D_K[.80]
U 11BA, 0500,003C,0180,0800,0000,11B8 :2287 D_D.LEFT
U 11B8, 0001,003C,0180,0A80,0000,11BC :2288 R[0]_D ; SET MASK FOR ALU Z BIT
U 11BC, 0018,0038,0580,0A88,0000,11BD :2289 R[1]_K[.1] ; SET THE ALU DATA
U 11BD, 0001,003C,0180,0A90,0000,11BE :2290 R[2]_D ; SET THE INITIAL DATA
U 11BE, 0018,0038,0980,09E0,0000,103A :2291 RC[0C]_K[.2] ; SET THE LOOP COUNT
U 103A, 0000,003D,0180,0800,0000,114E :2292 =0 ERLOOP
U 103B, 0000,003C,01C0,0A08,0000,11BF :2293 T169L2: Q_R[1] ; GET ALU DATA
U 11BF, 0800,003C,0180,0A10,0000,11C0 :2294 D_R[2]
U 11C0, 0000,003C,3180,3C00,0000,11C1 :2295 ID[CES]_D ; INIT THE Z BIT
U 11C1, 0001,203C,0180,0800,0010,11C2 :2296 SYNC17: ALU_Q,C[CLK.UBCC] ; EXECUTE THE TEST
U 11C2, 0810,0038,31F0,2D70,0000,11C3 :2297 Q_ID[CES]_D RC[0E] ; READ THE REGISTER
U 11C3, 001C,0034,01C0,0A00,0000,11C4 :2298 Q-Q.AND.R[0] ; MASK
U 11C4, 001D,2000,0180,0800,0010,11C5 :2299 ALU_Q-D,CLK.UBCC ; CHECK
U 11C5, 0000,013C,0180,0800,0000,103C :2300 Z?
U 103C, 0001,203D,0180,09E8,0000,1151 :2301 =0 ERROR2,RC[0D]_Q ; ALU Z BIT FAILED IN CES REG
U 103D, 0003,003C,0180,0A90,0000,11C6 :2302 R[2]_0 ; INIT THE INITIAL CES DATA
U 11C6, 0000,003C,0180,0A00,0000,11C7 :2303 LAB_R[0] ; GET THE EXPECTED DATA
U 11C7, 0000,003C,0180,09F0,0000,11C8 :2304 RC[0E]_LA
U 11C8, 0003,003C,0180,0A88,0000,11C9 :2305 R[1]_0 ; INIT THE ALU DATA
U 11C9, 0810,0038,0180,0960,0000,11CA :2306 D_RC[0C]
U 11CA, 0019,8000,0580,09E0,0010,11CB :2307 RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP
U 11CB, 0000,013C,0180,0800,0000,103E :2308 Z?
U 103E, 0000,003C,0180,0800,0000,103B :2309 =0 J/T169L2 ; CONTINUE
U 103F, 0000,003C,0180,0800,0000,11CC :2310 NOP
:2311
:2312
:2313 :////////////////////
:2314 :+
:2315 : NOW CHECK THE EALU Z BIT
:2316 :-
:2317
U 11CC, 0003,003C,0180,09F0,0000,1040 :2318 T169S3: RC[0E]_0 ; INIT EXPECTED DATA
U 1040, 0000,003D,0180,0800,0000,1169 :2319 =0 SUBTEST
U 1041, 0800,003C,0180,0A00,0000,11CD :2320 D_R[0] ; GET MASK FOR ALU Z BIT

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U 11CD, 0100,003C,0180,0800,0000,11CE :2321      D D.LEFT2      ; GENERATE MASK FOR EALU Z BIT
U 11CE, 0001,003C,0180,0A80,0000,11CF :2322      R[0]_D      ; SAVE
U 11CF, 0018,0038,0580,0A88,0000,11D0 :2323      R[1]_K[.1]  ; SET EALU DATA
U 11D0, 0001,003C,0180,0A90,0000,11D1 :2324      R[2]_D      ; SET THE INITIAL BIT VALUE
U 11D1, 0018,0038,0980,09E0,0000,1042 :2325      RC[0C]_K[.2] ; SET THE LOOP COUNT
U 1042, 0000,003D,0180,0800,0000,114E :2326      ERLOOP
U 1043, 0000,003C,0180,0A08,0082,11D2 :2327      T169L3: SC R[1] ; GET EALU DATA
U 11D2, 0800,003C,0180,0A10,0000,11D3 :2328      D R[2]      ; SET INITIAL DATA
U 11D3, 0C00,003C,3180,3C00,0000,11D4 :2329      ID[CES]_D
U 11D4, 0000,003C,0180,0800,0010,11D5 :2330      EALU SC,CLK.UBCC ; EXECUTE THE TEST
U 11D5, 0810,0038,31F0,2D70,0000,11D6 :2331      Q_ID[CES]_D RC[0E] ; READ THE CES REGISTER
U 11D6, 001C,0034,01C0,0A00,0000,11D7 :2332      Q-Q.AND.R[0]    ; MASK
U 11D7, 001D,2000,0180,0800,0010,11D8 :2333      ALU_Q-D,CLK.UBCC ; CHECK
U 11D8, 0000,013C,0180,0800,0000,1044 :2334      Z?
U 1044, 0001,203D,0180,09E8,0000,1151 :2335      ERROR2,RC[0D]_Q ; EALU Z BIT FAILED
U 1045, 0000,003C,0180,0A00,0000,11D9 :2336      LAB R[0]      ; GET NEXT EXPECTED DATA
U 11D9, 0000,003C,0180,09F0,0000,11DA :2337      RC[0E]_LA
U 11DA, 0003,003C,0180,0A88,0000,11DB :2338      R[1]_D      ; SET EALU DATA
U 11DB, 0003,003C,0180,0A90,0000,11DC :2339      R[2]_D      ; SET INITIAL DATA
U 11DC, 0810,0038,0180,0960,0000,11DD :2340      D RC[0C]
U 11DD, 0019,8000,0580,09E0,0010,11DE :2341      RC[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 11DE, 0000,013C,0180,0800,0000,1046 :2342      Z?
U 1046, 0000,003C,0180,0800,0000,1043 :2343      J/T169L3      ; CONTINUE
:2344
:2345
:2346      ;////////////////////
:2347      ;+
:2348      ; NOW CHECK EALU 09 BIT
:2349      ;-
:2350
U 1047, 0003,003C,0180,09F0,0000,1048 :2351      T169S4: RC[0E]_D ; SET THE INITIAL EXPECTED VALUE
U 1048, 0000,003D,0180,0800,0000,1159 :2352      SUBT ST
U 1049, 0800,003C,0180,0A00,0000,11DF :2353      D_R[0]
U 11DF, 0500,003C,0180,0800,0000,11E0 :2354      D-D.LEFT
U 11E0, 0001,003C,0180,0A80,0000,11E1 :2355      R[0]_D
U 11E1, 0001,003C,0180,0A90,0000,11E2 :2356      R[2]_D
U 11E2, 0003,003C,0180,0A88,0000,11E3 :2357      R[1]_D
U 11E3, 0018,0038,0980,09E0,0000,104A :2358      RC[0C]_K[.2]
U 104A, 0000,003D,0180,0800,0000,114E :2359      ERLOOP
U 104B, 0000,003C,0180,0A08,0082,11E4 :2360      T169L4: SC R[1] ; GET EALU DATA
U 11E4, 0800,003C,0180,0A10,0000,11E5 :2361      D R[2]
U 11E5, 0000,003C,3180,3C00,0000,11E6 :2362      ID[CES]_D
U 11E6, 0000,003C,0180,0800,0010,11E7 :2363      EALU SC,CLK.UBCC ; INIT THE EALU 09 BIT
U 11E7, 0810,0038,31F0,2D70,0000,11E8 :2364      Q_ID[CES]_D RC[0E] ; EXECUTE THE TEST
U 11E8, 001C,0034,01C0,0A00,0000,11E9 :2365      Q-Q.AND.R[0]    ; READ THE CES REGISTER
U 11E9, 001D,2000,0180,0800,0010,11EA :2366      ALU_Q-D,CLK.UBCC ; MASK
U 11EA, 0000,013C,0180,0800,0000,104C :2367      Z?
U 104C, 0001,203D,0180,09E8,0000,1151 :2368      ERROR2,RC[0D]_Q ; EALU N BIT FAILED IN CES
U 104D, 0000,003C,0180,0A00,0000,11EB :2369      LAB R[0]
U 11EB, 0000,003C,0180,09F0,0000,11EC :2370      RC[0E]_LA
U 11EC, 0818,0038,4180,0800,0000,11ED :2371      D_K[.80]
U 11ED, 0100,003C,0180,0800,0000,11EE :2372      D-D.LEFT2
U 11EE, 0001,003C,0180,0A88,0000,11EF :2373      R[1]_D
U 11EF, 0003,003C,0180,0A90,0000,11F0 :2374      R[2]_D
U 11F0, 0810,0038,0180,0960,0000,11F1 :2375      D_RC[0C]
      ; GENERATE EALU DATA AND SAVE

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ZZ-ESKAH-V132 TEST 169 CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD=1
ESKAH3C.MCR MICRO2 1M(01) 16-DEC-82 12:42:53

D 15

SEQ 1211
Page 6

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U 11F1, 0019,8000,0580,09E0,0010,11F2 :2376      RC[OC]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
U 11F2, 0000,013C,0180,0800,0000,1050 :2377      Z?
U 1050, 0000,003C,0180,0800,0000,1048 :2378      =0      J/T169L4
U 1051, 0000,003C,0180,0800,0000,1052 :2379      NOP
                                           :2380
                                           :2381
                                           :2382      ; FOLLOWING IS THE IB DATA FOR THE PC REGISTER INCREMENT TEST:
                                           :2383      ;X 48
                                           :2384      ;$ 9F90,8F90,C090
                                           :2385
```



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:2432
:2433
:2434
:2435
:2436
:2437
:2438
:2439
:2440
U 1052, 0000,003D,0180,0800,0000,113A
U 1053, 0018,0038,0D80,09F8,0000,11F3
U 11F3, 0018,0038,6580,0A80,0000,1054
U 1054, 0000,003D,0180,0800,0000,117C
U 1055, 0018,0038,7580,0A88,0000,11F4
U 11F4, 0018,0038,7980,0A90,0000,11F5
U 11F5, 0818,0038,4180,0800,0000,11F6
U 11F6, 0100,003C,0180,0800,0000,11F7
U 11F7, 0001,003C,0180,0A98,0000,11F8
U 11F8, 0018,0038,D580,09E0,0000,1056
U 1056, 0000,003D,0180,0800,0000,1169
U 1057, 0000,003C,0180,0A00,0200,11F9
U 11F9, 0000,803C,0180,C800,0000,11FA

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PAGE "TEST 16A CES REGISTER ALU N BIT"
*****
++
TEST 16A CES REGISTER ALU N BIT

TEST DESCRIPTION
THIS TEST CHECKS THE ALU N BIT IN THE CES REGISTER. THIS IS DONE
BY SELECTING THE ALU TO DO A+B AND A-B, AND F=B, WITH SPECIFIC
DATA PATTERNS ON THE AMX AND BMX TO CHECK THE LOGIC THAT GENERATES
THIS BIT.

SUBTST 1 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
BE EXECUTING AN A+B TO GET THE CORRECT ALU DATA.
SUBTST 2 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
BE EXECUTING AN A-B TO GET THE CORRECT ALU DATA.
SUBTST 3 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
BE EXECUTING ANYTHIN BUT AN A+B OR A-B.

LOGIC DESCRIPTION
THIS TEST CHECKS THE LOGIC NETWORK ON THE CEH MODULE THAT GENERATES
THE ALU N BIT, AND THE MULTIPLEXOR ON THE ICL MODULE THAT FEEDS
THE ALU N BIT IN THE CES REGISTER.

ERROR DESCRIPTION
DATA: EXPECTED CES REGISTER
RECEIVED CES REGISTER
LOOP COUNT - INDICATES WHICH DATA PATTERN IS BEING USED.
(SEE THE DATA AT THE END OF THE TEST)

SYNC POINT DESCRIPTION
SUBTST 1 - SYNC1A--ALU N BIT GETS LOADED
SUBTST 2 - SYNC1B--ALU N BIT GETS LOADED
SUBTST 3 - SYNC1C--ALU N BIT GETS LOADED
--
*****
=0
T16A: NEWTST
RC[0F]_K[.3]
RC[0]_K[.10] : ADDRESS OF AMX DATA
CALL J/UNJAM : CLEAR ANY SBI INTERRUPTS
RC[1]_K[.20] : ADDRESS OF BMX DATA
RC[2]_K[.30] : ADDRESS OF EXPECTED ALU N BIT
D_K[.80]
D_D.LEFT2 : GENERATE MASK FOR N BIT
RC[3]_D : SAVE

////////////////////////////////////
+
DO THOSE FUNCTIONS REQUIRING THE ALU TO DO AN A PLUS B
-

T16AS1: RC[0C]_K[.6] : SET THE LOP COUNT
=0 SUBTEST
T16AL1: VA R[0]
D[BYTE]_CACHE.P : FETCH AMX DATA

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U 11FA. 0001,003C,0180,0AAB,0000,11FB :2441      R[5] D                : SAVE
U 11FB. 0000,003C,0180,0A08,0200,11FC :2442      VA R[1]
U 11FC. 0000,803C,0180,C800,0000,11FD :2443      D[BYTE]_CACHE.P    : FETCH BMX DATA
U 11FD. 0001,003C,0180,09A8,0000,11FE :2444      R[5] D                : SAVE
U 11FE. 0000,003C,0180,0A10,0200,11FF :2445      VA R[2]
U 11FF. 0000,403C,0180,C800,0000,1200 :2446      D[WORD]_CACHE.P    : FETCH EXPECTED N BIT DATA
U 1200. 0802,403C,0180,0800,0000,1201 :2447      D_D.SXT[WORD]
U 1201. 0001,003C,0180,09F0,0000,1058 :2448      R[0E]_D            : SAVE
U 1058. 0000,003D,0180,0800,0000,114E :2449      ERLOOP
U 1059. 0810,0038,0180,0970,0000,1202 :2450      D_RC[0E]
U 1202. 0801,0028,0180,0800,0000,1203 :2451      D_NOT.D              : GENERATE INITIAL VALUE OF N BIT
U 1203. 081C,2034,0180,0A18,0000,1204 :2452      D_D.AND.R[3]         : MASK
U 1204. 0810,0038,3180,3D70,0000,1205 :2453      ID[CES]_D,D_RC[0E]  : INIT THE CES REGISTER
U 1205. 0000,003C,0180,0A28,0000,1206 :2454      LAB R[5]
U 1206. 0000,003C,0180,0928,0000,1207 :2455      LC R[5]
U 1207. 0010,8014,0180,0800,0010,1208 :2456      SYNC1A: ALD LA+LC,CLK.UBCC,BYTE : LATCH AMX AND BMX DATA
U 1208. 0000,003C,31F0,2C00,0000,1209 :2457      Q_ID[CES]           : EXECUTE THE TEST
U 1209. 001C,0034,01C0,0A18,0000,120A :2458      Q-Q.AND.R[3]         : MASK
U 120A. 001D,2000,0180,0800,0010,120B :2459      ACU_Q-D,CLK.UBCC    : CHECK
U 120B. 0000,013C,0180,0800,0000,105C :2460      Z?
U 105C. 0001,203D,0180,09E8,0000,1151 :2461      ERROR2,R[0D]_Q      : ALU N BIT FAILED IN CES REG
U 105D. 0000,003C,0180,0A00,0000,120C :2462      LAB R[0]
U 120C. 0018,0014,0580,0A80,0000,120D :2463      R[0] LA+K[.1]        : INCREMENT ADR OF AMX DATA
U 120D. 0000,003C,0180,0A08,0000,120E :2464      LAB R[1]
U 120E. 0018,0014,0580,0A88,0000,120F :2465      R[1] LA+K[.1]        : INCREMENT ADR OF BMX DATA
U 120F. 0000,003C,0180,0A10,0000,1210 :2466      LAB R[2]
U 1210. 0018,0014,0980,0A90,0000,1211 :2467      R[2] LA+K[.2]        : INCREMENT ADR OF EXPECTED DATA
U 1211. 0810,0038,0180,0960,0000,1212 :2468      D_RC[0C]
U 1212. 0019,8000,0580,09E0,0010,1213 :2469      R[0C]_D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
U 1213. 0000,013C,0180,0800,0000,1060 :2470      Z?
U 1060. 0000,003C,0180,0800,0000,1057 :2471      J/T16AL1            : CONTINUE
:2472
:2473
:2474 :////////////////////
:2475 :+
:2476 : NOW CHECK THOSE PATTERNS REQUIRING THE ALU TO DO AN A MINUS B
:2477 :-
:2478
U 1061. 0018,0038,0980,09E0,0000,1062 :2479      T16AS2: R[0C]_K[.2] : SET THE LOOP COUNT
U 1062. 0000,003D,0180,0800,0000,1169 :2480      =0 SUBTEST
U 1063. 0000,003C,0180,0A00,0200,1214 :2481      T16AL2: VA R[0]
U 1214. 0000,803C,0180,C800,0000,1215 :2482      D[BYTE]_CACHE.P    : FETCH AMX DATA
U 1215. 0001,003C,0180,0AAB,0000,1216 :2483      R[5] D                : SAVE
U 1216. 0000,003C,0180,0A08,0200,1217 :2484      VA R[1]
U 1217. 0000,803C,0180,C800,0000,1218 :2485      D[BYTE]_CACHE.P    : FETCH BMX DATA
U 1218. 0001,003C,0180,09A8,0000,1219 :2486      R[5] D                : SAVE
U 1219. 0000,003C,0180,0A10,0200,121A :2487      VA R[2]
U 121A. 0000,403C,0180,C800,0000,121B :2488      D[WORD]_CACHE.P    : FETCH EXPECTED N BIT DATA
U 121B. 0802,403C,0180,0800,0000,121C :2489      D_D.SXT[WORD]
U 121C. 0001,003C,0180,09F0,0000,1064 :2490      R[0E]_D            : SAVE
U 1064. 0000,003D,0180,0800,0000,114E :2491      ERLOOP
U 1065. 0810,0038,0180,0970,0000,121D :2492      D_RC[0E]
U 121D. 0801,0028,0180,0800,0000,121E :2493      D_NOT.D              : GENERATE INITIAL VALUE OF N BIT
U 121E. 081C,2034,0180,0A18,0000,121F :2494      D_D.AND.R[3]         : MASK
U 121F. 0810,0038,3180,3D70,0000,1220 :2495      ID[CES]_D,D_RC[0E]  : INIT THE CES REGISTER

```

```

U 1220, 0000,003C,0180,0A28,0000,1221 :2496
U 1221, 0000,003C,0180,0928,0000,1222 :2497
U 1222, 0010,8000,0180,0800,0010,1223 :2498
U 1223, 0000,003C,31F0,2C00,0000,1224 :2499
U 1224, 001C,0034,01C0,0A18,0000,1225 :2500
U 1225, 001D,2000,0180,0800,0010,1226 :2501
U 1226, 0000,013C,0180,0800,0000,1066 :2502
U 1066, 0001,203D,0180,09E8,0000,1151 :2503
U 1067, 0000,003C,0180,0A00,0000,1227 :2504
U 1227, 0018,0014,0580,0A80,0000,1228 :2505
U 1228, 0000,003C,0180,0A08,0000,1229 :2506
U 1229, 0018,0014,0580,0A88,0000,122A :2507
U 122A, 0000,003C,0180,0A10,0000,122B :2508
U 122B, 0018,0014,0980,0A90,0000,122C :2509
U 122C, 0810,0038,0180,0960,0000,122D :2510
U 122D, 0019,8000,0580,09E0,0010,122E :2511
U 122E, 0000,013C,0180,0800,0000,1068 :2512
U 1068, 0000,003C,0180,0800,0000,1063 :2513
:2514
:2515
:2516
:2517
:2518
:2519
:2520
U 1069, 0018,0038,0980,09E0,0000,106A :2521
U 106A, 0000,003D,0180,0800,0000,1169 :2522
U 106B, 0000,003C,0180,0A00,0200,122F :2523
U 122F, 0000,803C,0180,C800,0000,1230 :2524
U 1230, 0001,003C,0180,0AA8,0000,1231 :2525
U 1231, 0000,003C,0180,0A08,0200,1232 :2526
U 1232, 0000,803C,0180,C800,0000,1233 :2527
U 1233, 0001,003C,0180,09A8,0000,1234 :2528
U 1234, 0000,003C,0180,0A10,0200,1235 :2529
U 1235, 0000,403C,0180,C800,0000,1236 :2530
U 1236, 0802,403C,0180,0800,0000,1237 :2531
U 1237, 0001,003C,0180,09F0,0000,106C :2532
U 106C, 0000,003D,0180,0800,0000,114E :2533
U 106D, 0810,0038,0180,0970,0000,1238 :2534
U 1238, 0801,0028,0180,0800,0000,1239 :2535
U 1239, 081C,2034,0180,0A18,0000,123A :2536
U 123A, 0810,0038,3180,3D70,0000,123B :2537
U 123B, 0000,003C,0180,0A28,0000,123C :2538
U 123C, 0000,003C,0180,0928,0000,123D :2539
U 123D, 0010,8038,0180,0800,0010,123E :2540
U 123E, 0000,003C,31F0,2C00,0000,123F :2541
U 123F, 001C,0034,01C0,0A18,0000,1240 :2542
U 1240, 001D,2000,0180,0800,0010,1241 :2543
U 1241, 0000,013C,0180,0800,0000,106E :2544
U 106E, 0001,203D,0180,09E8,0000,1151 :2545
U 106F, 0000,003C,0180,0A00,0000,1242 :2546
U 1242, 0018,0014,0580,0A80,0000,1243 :2547
U 1243, 0000,003C,0180,0A08,0000,1244 :2548
U 1244, 0018,0014,0580,0A88,0000,1245 :2549
U 1245, 0000,003C,0180,0A10,0000,1246 :2550

```

```

LAB R[5]
LC R[5]
: LATCH AMX AND BMX DATA
SYNC1B: ALD LA-LC,CLK.UBCC,BYTE : EXECUTE THE TEST
Q_ID[CES]
Q-Q.AND.R[3] : MASK
ALU_Q-D,CLK.UBCC : CHECK
Z?
=0 ERROR2,R[0D]_Q : ALU N BIT FAILED IN CES REG
LAB R[0]
R[0] LA+K[.1] : INCREMENT ADR OF AMX DATA
LAB R[1]
R[1] LA+K[.1] : INCREMENT ADR OF BMX DATA
LAB R[2]
R[2] LA+K[.2] : INCREMENT ADR OF EXPECTED DATA
D_R[0C]
R[0C]_D-K[.1],CLK.UBCC,BYTE : CHECK THE LOOP COUNT
Z?
=0 J/T16AL2 : CONTINUE

:////////////////////
:
: NOW CHECK THOSE PATTERNS REQUIRING THE ALU TO DO AN F=B
:
:
T16AS3: R[0C] K[.2] : SET THE LOOP COUNT
=0 SUBTEST
T16AL3: VA R[0]
D[BYTE]_CACHE.P : FETCH AMX DATA
R[5] D : SAVE
VA R[1]
D[BYTE]_CACHE.P : FETCH BMX DATA
R[5] D : SAVE
VA R[2]
D[WORD]_CACHE.P : FETCH EXPECTED N BIT DATA
D_D.SXT[WORD]
R[0E]_D : SAVE
=0 ERLOOP
D_R[0E]
D_NOT.D : GENERATE INITIAL VALUE OF N BIT
D-D.AND.R[3] : MASK
ID[CES]_D,D_R[0E] : INIT THE CES REGISTER
LAB R[5]
LC R[5]
: LATCH AMX AND BMX DATA
SYNC1C: ALD LC,CLK.UBCC,BYTE,AMX/LA : EXECUTE THE TEST
Q_ID[CES]
Q-Q.AND.R[3] : MASK
ALU_Q-D,CLK.UBCC : CHECK
Z?
=0 ERROR2,R[0D]_Q : ALU N BIT FAILED IN CES REG
LAB R[0]
R[0] LA+K[.1] : INCREMENT ADR OF AMX DATA
LAB R[1]
R[1] LA+K[.1] : INCREMENT ADR OF BMX DATA
LAB R[2]

```



```

U 1246, 0018,0014,0980,0A90,0000,1247 :2551
U 1247, 0810,0038,0180,0960,0000,1248 :2552
U 1248, 0019,8000,0580,09E0,0010,1249 :2553
U 1249, 0000,013C,0180,0800,0000,1070 :2554
U 1070, 0000,003C,0180,0800,0000,106B :2555
U 1071, 0000,003C,0180,0800,0000,1072 :2556
:2557
:2558
:2559
:2560
:2561
:2562
:2563
:2564
:2565
:2566
:2567
:2568
:2569
:2570
:2571
:2572
:2573
:2574
:2575
:2576
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:2578
:2579
:2580
:2581
:2582
:2583
:2584
:2585
:2586
:2587

```

```

R[2] LA+K[.2] ; INCREMENT ADR OF EXPECTED DATA
D RC[0C]
R[0C]_D-K[.1],CLK.UBCC,BYTE ; CHECK THE LOOP COUNT
Z?
=0 J/T16AL3 ; CONTINUE
NOP

```

: FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:

```

:Z 10
: SUBTST 1 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 0080,4080,C040
: SUBTST 2 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 0000
: SUBTST 3 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 8000

```

: FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:

```

:Z 20
: SUBTST 1 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 8000,4080,40C0
: SUBTST 2 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 8001
: SUBTST 3 - USES ONE BYTE EACH TIME THRU THE LOOP
:$ 0080

```

: FOLLOWING IS THE EXPECTED N DATA FOR THE ABOVE TEST:

```

:Z 30
: SUBTST 1 - USES ONE WORD EACH TIME THRU THE LOOP
:$ 200,200,200,0000,0000,0000
: SUBTST 2 - USES ONE WORD EACH TIME THRU THE LOOP
:$ 200,0000
: SUBTST 3 - USES ONE WORD EACH TIME THRU THE LOOP
:$ 200,0000

```



```

2588 .PAGE 'TEST 16B CES REGISTER BITS <15:12> (CS PARITY ERROR)'
2589 .....
2590 .+
2591 .TEST 16B CES REGISTER BITS <15:12> (CS PARITY ERROR)
2592
2593 .TEST DESCRIPTION
2594 .THIS TEST CHECKS BITS <15:12> OF THE CES REGISTER. THIS IS DONE BY
2595 .WRITING BAD PARITY IN A WCS LOCATION, EXECUTING THE LOCATION, AND
2596 .CHECKING THAT THE CORRECT BITS SET IN THE CES REGISTER. THE BITS
2597 .<14:12> ARE CHECKED ONE AT A TIME.
2598
2599 .LOGIC DESCRIPTION
2600 .THIS TEST CHECKS THE CS PARITY ERROR LATCHES AND THEIR INTERFACE
2601 .TO THE ID BUS, ON THE ICL MODULE.
2602
2603 .ERROR DESCRIPTION
2604 .DATA: EXPECTED CES REGISTER
2605 .RECEIVED CES REGISTER
2606 .LOOP COUNT - INDICATES WHICH 32 BIT GROUP OF WCS SHOULD
2607 .CONTAIN BAD PARITY, I.E. 3= GROUP 0, 2= GROUP 1, ETC.
2608
2609 .SYNC POINT DESCRIPTION
2610 .ADDRESS 1300 - PCS PARITY ERROR SHOULD BE ASSERTED
2611 .ADDRESS SYNC1D--CES REGISTER IS READ
2612 .--
2613 .....
2614 .=0
2615 T16B: NEWTST
2616 RC[0F]_K[.3]
2617 =0 D_K[.1],CALL,J/DC3 ; GENERATE ADDRESS OF LOCATION
2618 NOP ; ...
2619 =0 CALL,J/DC0
2620 NOP
2621 =0 CALL,J/DC0
2622 RC[0]_D ; SAVE THIS ADDRESS IN R0 = 1300
2623 RC[3]_D.OR.K[.8000] ; SAVE ADDRESS PLUS PARITY INVERT BIT IN R3
2624 =0 CALL,J/UNJAM ; CLEAR ANY SBI INTERRUPTS
2625 SC_K[.8],Q_0
2626 D_RC[.F0] ; GENERATE MASK FOR CES REGISTER
2627 D-DAL.SC
2628 RC[1]_D ; SAVE IN R1
2629 =0 D_K[.2],CALL[DCD] ; GENERATE PROCESSOR REGISTER NUMBER
2630 RC[4]_D ; FOR CALL TO PCS
2631 D_K[.20] ; GENERATE THE INCREMENT VALUE
2632 D-DAL.SC ; FOR THE WCS GROUP SELECT
2633 RC[2]_D ; SAVE IN R2
2634 =0 D_K[.9],CALL,J/DC0 ; GENERATE THE INITIAL EXPECTED
2635 D-DAL.SC ; VALUE OF THE CES REGISTER
2636 RC[0E]_D ; SAVE FOR TIMEOUT
2637 RC[0A]_D ; SAVE FOR GENERATION OF NEXT VALUE
2638
2639 .//////////
2640 .+
2641 .NOW CHECK EACH GROUP FOR THE CORRECT PARITY ERROR INDICATION IN THE CES REGISTER
2642 .--

```

```

U 1072. 0000.003D.0180.0800.0000.113A
U 1073. 0018.0038.0D80.09F8.0000.1074
U 1074. 0818.0039.0580.0800.0000.1157
U 1075. 0000.003C.0180.0800.0000.1076
U 1076. 0000.003D.0180.0800.0000.1153
U 1077. 0000.003C.0180.0800.0000.1078
U 1078. 0000.003D.0180.0800.0000.1153
U 1079. 0001.003C.0180.0A80.0000.124A
U 124A. 0019.0030.4580.0A98.0000.107A
U 107A. 0000.003D.0180.0800.0000.117C
U 107B. 0000.003C.01F8.0800.0084.724B
U 124B. 0818.0038.CD80.0800.0000.124C
U 124C. 0D00.003C.0180.0800.0000.124D
U 124D. 0001.003C.0180.0A88.0000.107C
U 107C. 0818.0039.0980.0800.0000.1161
U 107D. 0001.003C.0180.0AA0.0000.124E
U 124E. 0818.0038.7580.0800.0000.124F
U 124F. 0D00.003C.0180.0800.0000.1250
U 1250. 0001.003C.0180.0A90.0000.107E
U 107E. 0818.0039.D980.0800.0000.1153
U 107F. 0D00.003C.0180.0800.0000.1251
U 1251. 0001.003C.0180.09F0.0000.1252
U 1252. 0001.003C.0180.09D0.0000.1253

```

```

:2643
U 1253, 0018,0038,0D80,09E0,0000,1254 :2644 RC[OC],K[.3] ; SET THE LOOP COUNT
U 1254, 0800,003C,0180,0A00,0000,104F :2645 T16BL1: D_R[0] ; GET ADDRESS TO WRITE TO
U 104F, 0000,003D,8980,3C00,0000,100E :2646 =0**** ID[WCS.ADDR]_D,CALL[WRITEWCS] ; WRITE WCS WITH GOOD PARITY
U 105F, 0000,003C,0180,0800,0000,1080 :2647 NOP
U 1080, 0000,003D,0180,0800,0000,100E :2648 =0**** CALL[WRITEWCS] ; WRITE WCS
U 1090, 0000,003C,0180,0800,0000,1081 :2649 NOP
U 1081, 0000,003D,0180,0800,0000,100E :2650 =0**** CALL[WRITEWCS] ; WRITE THE THIRD 32 BITS
U 1091, 0800,003C,0180,0A18,0000,1082 :2651 D_R[3]
U 1082, 0000,003D,8980,3C00,0000,100E :2652 =0**** ID[WCS.ADDR]_D,CALL[WRITEWCS] ; WRITE BAD PARITY IN ONE BANK
U 1092, 0000,003C,0180,0800,0000,1084 :2653 NOP
U 1084, 0000,003D,0180,0800,0000,114E :2654 =0 ERLOOP
U 1085, 0000,003C,0180,0950,0000,1255 :2655 LC_RC[0A] ; GET EXPECTED VALUE OF CES
U 1255, 0010,0038,0180,09F0,0000,1256 :2656 RC[OE] LC ; SAVE FOR TYPEOUT
U 1256, 0018,0038,4580,0AF8,0000,1257 :2657 RC[OF],K[.8000] ; SET TRAP EXPECTED FLAG
U 1257, 0818,0038,4580,0800,0000,1258 :2658 D_K[.8000]
U 1258, 0000,003C,3180,3C00,0000,1086 :2659 ID[CES] D ; CLEAR THE CES FIRST
U 1086, 0000,003D,0180,0800,0000,1300 :2660 =0 CALL,J/T300 ; GO EXECUTE THE PARITY ERROR
U 1087, 0810,0038,31F0,2D70,0000,1259 :2661 SYNC1D: Q_ID[CES],D_RC[OE] ; READ THE CES REGISTER
U 1259, 001C,0034,01C0,0A08,0000,125A :2662 Q-Q.AND,R[1] ; MASK
U 125A, 001D,2000,0180,0800,0010,125B :2663 ACU_Q-D,CLK.UBCC ; CHECK
U 125B, 0000,013C,0180,0800,0000,1088 :2664 Z?
U 1088, 0001,203D,0180,09E8,0000,1151 :2665 =0 ERROR2,RC[OD]_Q ; CES REGISTER FAILED PARITY BITS
U 1089, 0818,0038,4580,0800,0000,125C :2666 D_K[.8000] ; GET DATA TO CLEAR CES PARITY BITS
U 125C, 0000,003C,3180,3C00,0000,125D :2667 ID[CES] D ; CLEAR THE CES PARITY BITS
U 125D, 0F00,003C,31F0,2C00,0000,125E :2668 Q_ID[CES],D_0 ; READ THEM BACK
U 125E, 0003,003C,0180,09F0,0000,125F :2669 RC[OE] 0 ; SET EXPECTED VALUE FOR TYPEOUT
U 125F, 001C,0034,01C0,0A08,0000,1260 :2670 Q-Q.AND,R[1] ; MASK
U 1260, 001D,2000,0180,0800,0010,1261 :2671 ACU_Q-D,CLK.UBCC ; CHECK
U 1261, 0000,013C,0180,0800,0000,108A :2672 Z?
U 108A, 0001,203D,0180,09E8,0000,1151 :2673 =0 ERROR2,RC[OD]_Q ; PARITY BITS IN CES DID NOT CLEAR
U 108B, 0800,003C,0180,0A18,0000,1262 :2674 D_R[3] ; INCREMENT THE WCS GROUP ADDRESS
U 1262, 0000,003C,0180,0A10,0000,1263 :2675 LXB,R[2] ; TO WRITE THE BAD PARITY INTO
U 1263, 001C,2014,0180,0A98,0000,1264 :2676 R[3],LA+D
U 1264, 0810,0038,0180,0950,0000,1265 :2677 D_RC[0A] ; GET THE CURRENT EXPECTED CES DATA
U 1265, 0500,003C,0180,0800,0000,1266 :2678 D_D.LEFT ; GENERATE NEXT EXPECTED DATA
U 1266, 0819,0030,4580,0800,0000,1267 :2679 D_D.OR,K[.8000] ; INSERT PE SUM BIT
U 1267, 081C,2034,0180,0A08,0000,1268 :2680 D_D.AND,R[1] ; MASK
U 1268, 0C01,003C,0180,09DC,0000,1269 :2681 RC[0A] D ; SAVE NEW EXPECTED CES DATA
U 1269, 0810,0038,0180,0960,0000,126A :2682 D_RC[OC]
U 126A, 0019,8000,0580,09E0,0010,126B :2683 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT THE LOOP COUNT
U 126B, 0000,013C,0180,0800,0000,108C :2684 Z?
U 108C, 0000,003C,0180,0800,0000,1254 :2685 =0 J/T16BL1 ; CONTINUE
U 108D, 0000,003C,0180,0800,0000,108E :2686 NOP
:2687
:2688
:2689
    
```

```

:2690 .PAGE 'TEST 16C RECEIVER AND INTERVAL TIMER INTERRUPTS'
:2691 .*****
:2692 .++
:2693 .
:2694 .TEST 16C RECEIVER AND INTERVAL TIMER INTERRUPTS
:2695 .
:2696 .TEST DESCRIPTION
:2697 .THIS TEST CHECKS THAT THE RECEIVER INTERRUPT AND THE INTERVAL
:2698 .TIMER INTERRUPT GENERATE THE CORRECT IPL ACTIVE LEVELS AND
:2699 .THE CORRECT VECTOR.
:2700 .
:2701 .SUBTST 1 - CHECK THE RECEIVER INTERRUPT
:2702 .SUBTST 2 - CHECK THE INTERVAL TIMER INTERRUPT
:2703 .
:2704 .LOGIC DESCRIPTION
:2705 .THIS TEST CHECKS PART OF THE MULTIPLEXORS THAT GENERATE THE IPL
:2706 .ACTIVE BITS AND PART OF THE PRIORITY ENCODERS FOR THE IPL ACTIVE
:2707 .BITS AND PART OF THE VECTOR ROM ON THE ICL MODULE.
:2708 .
:2709 .ERROR DESCRIPTION
:2710 .DATA: EXPECTED IPL LEVEL OR VECTOR
:2711 .RECEIVED IPL LEVEL OR VECTOR
:2712 .ERROR TYPE FLAG -- 0=IPL ACTIVE
:2713 .
:2714 .SYNC POINT DESCRIPTION
:2715 .SUBTST 1 - SYNCOC--LATCH RECEIVER INTERRUPT
:2716 .SYNCOB--READ IPL ACTIVE BITS
:2717 .SYNCOE--READ VECTOR BITS
:2718 .SYNCOF--CLEAR RECEIVER INTERRUPT
:2719 .SUBTST 2 - SYNCIO--LATCH INTERVAL TIMER INTERRUPT
:2720 .SYNCOB--READ IPL ACTIVE BITS
:2721 .SYNCOE--READ VECTOR BITS
:2722 .SYNCOF--H1R 18 SHOULD CLEAR
:2723 .SYNCOG--H1R 18 SHOULD CLEAR
:2724 .--
:2725 .*****
:2726 .
:2727 .T16C: NEWTST
:2728 .RC[0F] K[.3]
:2729 .D K[.1F],Q_0 ; GENERATE MASK FOR IPL ACTIVE
:2730 .SC K[.10] ; ...
:2731 .D DAL.SC
:2732 .R[2]_D ; EQUALS 001F0000
:2733 .=0 CALL,J/UNJAM ; CLEAR ANY SBI INTERRUPTS
:2734 .
:2735 .////////////////////
:2736 .+
:2737 .CHECK HIR 14 (ALSO IPL ACTIVE 14) BY SETTING THE INTERRUPT
:2738 .ENABLE BIT IN THE RXCS REGISTER
:2739 .-
:2740 .
:2741 .T16CS1: RC[0C] 0
:2742 .=0 SUBTEST
:2743 .SC K[.10] ; SETUP FOR A WORD SHIFT
:2744 .D_R[.14],Q_0 ; GENERATE THE EXPECTED DATA

```

U 108E, 0000,003D,0180,0800,0000,113A
U 108F, 0018,0038,0D80,09F8,0000,126C
U 126C, 0818,0038,8DF8,0800,0000,126D
U 126D, 0000,003C,6580,0800,0084,726E
U 126E, 0D00,003C,0180,0800,0000,126F
U 126F, 0001,003C,0180,0A90,0000,1094
U 1094, 0000,003D,0180,0800,0000,117C

U 1095, 00C3,003C,0180,09E0,0000,1096
U 1096, 0000,003D,0180,0800,0000,1169
U 1097, 0000,003C,6580,0800,0084,7270
U 1270, 0818,0038,21F8,0800,0000,1271


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U 1271, 0000,003C,0180,0800,0000,1272 :2745      D DAL,SC
U 1272, 0001,003C,0180,09F0,0000,1098 :2746      RC[OE] D
U 1098, 0018,0039,4180,0AD0,0000,1174 :2747      SETRXCS[.80]          : SAVE
U 1099, 0000,003C,0180,0800,0000,109A :2748      NOP                  : SET THE READY BIT IN THE RXCS
U 109A, 0000,003D,0180,0800,0000,114E :2749      ERLOOP
U 109B, 0818,0038,3180,0800,0000,1273 :2750      D K[.40]
U 1273, 0000,003C,1180,3C00,0000,1274 :2751      ID[RXCS]_D          : SET THE INTERRUPT ENABLE BIT
U 1274, 0000,003C,0180,0800,0000,1275 :2752      NOP                  : ALLOW SYNC CREC INTR TO SET
U 1275, 0000,003C,0180,0800,4000,1276 :2753      SYNCOC: INTRPT.STROBE : LATCH THE CONSOLE INTERRUPT
U 1276, 0310,0038,39F0,2D70,0000,1277 :2754      SYNCOD: Q_ID[SIR],D RC[OE] : READ THE IPL ACTIVE BITS
U 1277, 001C,0034,01C0,0A10,0000,1278 :2755      Q-Q.AND.R[2]          : MASK
U 1278, 001D,2000,0180,0800,0010,1279 :2756      ACU_Q-D,CLK.UBCC      : CHECK
U 1279, 0000,013C,0180,0800,0000,109C :2757      Z?
U 109C, 0001,203D,0180,09E8,0000,1151 :2758      =0      ERROR2,RC[OD]_Q : IPL ACTIVE INCORRECT
:2759
:2760      ;+
:2761      ; NOW CHECK THE VECTOR FOR IPL ACTIVE 14
:2762      ; -
:2763
U 109D, 0018,0038,0580,09E0,0000,109E :2764      RC[OC] K[.1]          : SET THE ERROR TYPE FLAG
U 109E, 0818,0039,6180,0800,0000,115C :2765      =0      D K[.F],CALL,J/DCB : GENERATE THE VECTOR
U 109F, 0001,003C,0180,09F0,0000,10A0 :2766      RC[OE]_D              : SAVE
U 10A0, 0000,003D,0180,0800,0000,114E :2767      ERLOOP
U 10A1, 0810,0038,35F0,2D70,0000,127A :2768      SYNCOE: Q_ID[VECTOR],D RC[OE] : READ THE VECTOR REG
U 127A, 0019,2034,81C0,0800,0000,127B :2769      Q-Q.AND.K[.3FF]      : MASK
U 127B, 001D,2000,0180,0800,0010,127C :2770      ACU_Q-D,CLK.UBCC      : CHECK
U 127C, 0000,013C,0180,0800,0000,10A2 :2771      Z?
U 10A2, 0001,203D,0180,09E8,0000,1151 :2772      =0      ERROR2,RC[OD]_Q : VECTOR INCORRECT
:2773
:2774      ;+
:2775      ; NOW CHECK THAT THE INTERRUPT REQUEST CLEARS WITH AN INTERPT ACK
:2776      ; -
:2777
U 10A3, 0F00,003C,0180,0800,0000,127D :2778      D 0
U 127D, 0000,003C,1180,3C00,0000,127E :2779      ID[RXCS] D
U 127E, 0003,003C,0180,09F0,8000,127F :2780      SYNCOF: INTRPT.ACK,RC[OE]_0 : CLEAR INTERRUPT ENABLE
U 127F, 0000,003C,0180,0800,0000,1280 :2781      NOP                  : CLEAR THE INTERRUPT REQUEST
U 1280, 0000,003C,0180,0800,4000,1281 :2782      INTRPT.STROBE        : ALLOW SYNC CREC INTR TO CLEAR
U 1281, 0F00,003C,39F0,2C00,0000,1282 :2783      Q_ID[SIR],D 0          : CLEAR HIR 14
U 1282, 001C,0034,01C0,0A10,0000,1283 :2784      Q-Q.AND.R[2]          : READ THE IPL ACTIVE BITS
U 1283, 001D,2000,0180,0800,0010,1284 :2785      ACU_Q-D,CLK.UBCC      : MASK
U 1284, 0000,013C,0180,0800,0000,10A4 :2786      Z?                  : CHECK
U 10A4, 0001,203D,0180,09E8,0000,1151 :2787      =0      ERROR2,RC[OD]_Q : IPL 14 DID NOT CLEAR
U 10A5, 0000,003C,0180,0800,0000,10A6 :2788      NOP
U 10A6, 0018,0039,1980,CAD0,0000,1174 :2789      =0      SETRXCS[ZERO]   : CLEAR THE READY BIT
:2790
:2791      ;////////////////////
:2792      ;+
:2793      ; NOW CHECK THE INTERVAL TIMER INTERRUPT
:2794      ; -
:2795
U 10A7, 081B,0000,0580,0800,0000,1285 :2796      T16CS2: D 0-K[.1]      : GET DATA FOR TIMER
U 1285, 0000,003C,2580,3C00,00C0,10A8 :2797      ID[NXT.PER]_D          : LOAD THE NEXT INTERVAL REG
U 10A8, 0000,003D,0180,0800,0000,1169 :2798      =0      SUBTEST
U 10A9, 081B,0038,6580,0800,0000,1286 :2799      D_K[.10]

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U 1286, 0000,003C,2980,3C00,0000,1287 :2800      ID[CLK.CS]_D      : LOAD THE INTERVAL REGISTER
U 1287, 0000,003C,6580,0800,0084,7288 :2801      SC_K[.10]      : SETUP FOR A WORD SHIFT
U 1288, 0818,0038,21F8,0800,0000,1289 :2802      D_R[.14],Q_0    : GENERATE EXPECTED IPL LEVEL
U 1289, 0819,0014,1180,0800,0000,128A :2803      D-D+K[.4]
U 128A, 0D00,003C,0180,0800,0000,128B :2804      D-DAL.SC
U 128B, 0001,003C,0180,09F0,0000,128C :2805      RC[OE]_D      : EQUALS 00180000
U 128C, 0818,0038,3180,0800,0000,128D :2806      D_K[.40]
U 128D, 0000,003C,2980,3C00,0000,128E :2807      ID[CLK.CS]_D      : SET INTERRUPT ENABLE
U 128E, 0003,003C,0180,09E0,0000,10AA :2808      RC[OC]_0      : SET THE ERROR TYPE FLAG
U 10AA, 0000,003D,0180,0800,0000,114E :2809      ERLOOP-
U 10AB, 0810,0038,0180,0970,4000,128F :2810 SYNC10: INTRPT.STROBE,D_RC[OE] : LATCH THE INTERRUPT REQUEST
U 128F, 0000,003C,39F0,2C00,0000,1290 :2811 SYNC11: Q_ID[SIR]      : GET THE IPL ACTIVE BITS
U 1290, 001C,0034,01C0,0A10,0000,1291 :2812      Q-Q.AND.R[2]    : MASK
U 1291, 001D,2000,0180,0800,0010,1292 :2813      A[U_Q-D,CLK.UBCC : CHECK
U 1292, 0000,013C,0180,0800,0000,10AC :2814      Z?
U 10AC, 0001,203D,0180,09E8,0000,1151 :2815      =0      ERROR2,RC[OD]_0 : IPL ACTIVE INCORRECT
:2816
:2817 :+
:2818 : NOW CHECK THE VECTOR FOR IPL ACTIVE 18
:2819 :-
:2820
U 10AD, 0018,0038,0580,09E0,0000,1293 :2821      RC[OC]_K[.1]    : SET THE ERROR TYPE FLAG
U 1293, 0018,0038,0180,09F0,0000,10AE :2822      RC[OE]_K[.C0]   : SET THE EXPECTED VECTOR
U 10AE, 0000,003D,0180,0800,0000,114E :2823      =0      ERLOOP-
U 10AF, 0810,0038,35F0,2D70,0000,1294 :2824 SYNC12: Q_ID[VECTOR],D_RC[OE] : READ THE VECTOR
U 1294, 0019,2034,81C0,0800,0000,1295 :2825      Q-Q.AND.K[.3FF] : MASK
U 1295, 001D,2000,0180,0800,0010,1296 :2826      A[U_Q-D,CLK.UBCC : CHECK
U 1296, 0000,013C,0180,0800,0000,10B0 :2827      Z?
U 10B0, 0001,203D,0180,09E8,0000,1151 :2828      =0      ERROR2,RC[OD]_0 : VECTOR INCORRECT
:2829
:2830 :+
:2831 : NOW CHECK THAT TIMER INTER REQ GOES FALSE WHEN THE INTER ENABLE IS CLEAR
:2832 :-
:2833
U 10B1, 0003,003C,0180,09F0,0000,10B2 :2834      RC[OE]_0      : SET EXPECTED IPL
U 10B2, 0000,003D,0180,0800,0000,114E :2835      =0      ERLOOP-
U 10B3, 0818,0038,3180,0800,0000,1297 :2836      D_K[.40]
U 1297, 0000,003C,2980,3C00,0000,1298 :2837      ID[CLK.CS]_D      : SET INTERRUPT ENABLE
U 1298, 0F00,003C,0180,0800,4000,1299 :2838      INTRPT.STROBE,D_0 : LATCH THE HIR 18
U 1299, 0000,003C,2980,3C00,0000,129A :2839      ID[CLK.CS]_D      : CLEAR THE INTERRUPT ENABLE
U 129A, 0810,0038,0180,0970,4000,129B :2840 SYNC13: INTRPT.STROBE,D_RC[OE] : CLEAR THE HIR 18
U 129B, 0000,003C,39F0,2C00,0000,129C :2841      Q_ID[SIR]      : READ THE IPL ACTIVE
U 129C, 001C,0034,01C0,0A10,0000,129D :2842      Q-Q.AND.R[2]    : MASK
U 129D, 001D,2000,0180,0800,0010,129E :2843      A[U_Q-D,CLK.UBCC : CHECK
U 129E, 0000,013C,0180,0800,0000,10B4 :2844      Z?
U 10B4, 0001,203D,0180,09E8,0000,1151 :2845      =0      ERROR2,RC[OD]_0 : INTERRUPT ENABLE DOES NOT INHIBIT
:2846 : INTERVAL TIMER INTERRUPT
:2847
:2848 :+
:2849 : NOW CHECK THAT THE INTERVAL INTERRUPT GOES AWAY WHEN THE TIMER INT REQ
:2850 : IS CLEARED
:2851 :-
:2852
U 10B5, 0000,003C,0180,0800,0000,10B6 :2853      NOP
U 10B6, 0000,003D,0180,0800,0000,114E :2854      =0      ERLOOP

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U 10B7.	0818,0038,6580,0800,0000,129F	:2855	D K[.10]	
U 129F.	0000,003C,2980,3C00,0000,12A0	:2856	ID[CLK.CS]_D	: RESET THE DIVIDE BY 5 CTR
U 12A0.	0000,003C,0180,0800,0000,12A1	:2857	NOP	: WAIT FOR INTERRUPT REQ
U 12A1.	0000,003C,0180,0800,0000,12A2	:2858	NOP	
U 12A2.	0000,003C,0180,0800,0000,12A3	:2859	NOP	
U 12A3.	0818,0038,0180,0800,4000,12A4	:2860	INTRPT.STROBE,D_K[.C0]	: LATCH THE HIR 18
U 12A4.	0000,003C,2980,3C00,0000,12A5	:2861	ID[CLK.CS]_D	: CLEAR THE INTER REQ
U 12A5.	0810,0038,0180,0970,4000,12A6	:2862	SYNC14: INTRPT.STROBE,D_RC[0E]	: CLOCK THE HIR REGISTER
U 12A6.	0000,003C,39F0,2C00,0000,12A7	:2863	Q_ID[SIR]	: READ THE IPL ACTIVE
U 12A7.	001C,0034,01C0,0A10,0000,12A8	:2864	Q-Q.AND.R[2]	: MASK
U 12A8.	001D,2000,0180,0800,0010,12A9	:2865	A[U_Q-D,CLK.UBCC	: CHECK
U 12A9.	0000,013C,0180,0800,0000,10B8	:2866	Z?	
U 10B8.	0001,203D,0180,09E8,0000,1151	:2867	=0 ERROR2,RC[0D]_Q	: INT REQ FALSE DID NOT DISABLE
		:2868		: TIMER INTERRUPT
U 10B9.	0F00,003C,0180,0800,0000,12AB	:2869	D 0	
U 12AB.	0000,003C,2980,3C00,0000,10BA	:2870	ID[CLK.CS]_D	: CLEAR THE INTRPT ENABLE
		:2871		
		:2872		

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:2873 .PAGE 'TEST 16D CONSOLE INTERRUPT DISABLE'
:2874 *****
:2875 ++
:2876
:2877 TEST 16D CONSOLE INTERRUPT DISABLE
:2878
:2879 TEST DESCRIPTION
:2880 THIS TEST CHECKS THAT BIT 8 IN THE MACHINE CONTROL REGISTER, IN THE
:2881 CONSOLE INTERFACE, DISABLES THE TRANSMITTER AND RECEIVER INTERRUPTS.
:2882
:2883 SUBTST 1 - CHECK THE TRANSMITTER INTERRUPT DISABLE
:2884 SUBTST 2 - CHECK THE RECEIVER INTERRUPT DISABLE
:2885
:2886 LOGIC DESCRIPTION
:2887 THIS TEST CHECKS THE LOGIC ON THE CIB MODULE THAT DISABLES THE
:2888 CNSL XMIT AND CNSL RCV INTR SIGNALS THAT GO TO THE ICL MODULE.
:2889
:2890 ERROR DESCRIPTION
:2891 DATA: EXPECTED IPL ACTIVE LEVEL
:2892 RECIEVED IPL ACTIVE LEVEL
:2893
:2894 SYNC POINT DESCRIPTION
:2895 SUBTST 1 - SYNC1F--RCV INTRPT IS STROBED INTO HIR LATCH
:2896 SUBTST 2 - SYNCB1--XMIT INTRPT IS STROBED INTO HIR LATCH
:2897 SYNCB2--XMIT INTRPT IS STROBED INTO HIR LATCH
:2898 --
:2899 *****
:2900 =0
:2901 T16D: NEWTST
:2902 RC[0F] K[.2]
:2903 D K[.1F] Q 0 ; GENERATE THE MASK FOR THE IPL
:2904 SC K[.10] ; ACTIVE BITS
:2905 D DAL.SC ;
:2906 R[2] D ; SAVE IN R2
:2907 =0 CALL J/UNJAM
:2908
:2909 //////////////////////////////////////
:2910 +
:2911 FIRST CHECK THAT THE TRANSMITTER INTERRUPT IS DISABLED
:2912 -
:2913
:2914 T16DS1: NOP
:2915 =0 SUBTEST
:2916 RC[0E] 0 ; SET THE EXPECTED IPL ACTIVE LEVEL
:2917 =0 ERLOOP
:2918 D 0
:2919 ID[TXCS] D ; ENSURE INTRPT ENABLE CLEAR
:2920 =0 SETMCR[ZERO] ; CLEAR INTRPT DISABLE BIT
:2921 D K[.40]
:2922 ID[TXCS] D ; SET THE INTERRUPT ENABLE BIT
:2923 D K[.80]
:2924 D D.LEFT ; GEN PATTERN TO SET INTRPT DISABLE
:2925 =0 R[0A] D,CALL J/SETMCR ; SET THE INTRPT DISABLE BIT
:2926 NOP ; ALLOW SYNC CXMT TO CLEAR
:2927 SYNC1F: INTRPT.STROBE ; LATCH THE INTRPT SIGNAL

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U 10BA, 0000,003D,0180,0800,0000,113A
U 10BB, 0018,0038,0980,09F8,0C00,12AC
U 12AC, 0818,0038,8DF8,0800,0000,12AD
U 12AD, 0000,003C,6580,0800,0084,72AE
U 12AE, 0D00,003C,0180,0800,0000,12AF
U 12AF, 0001,003C,0180,0A90,0000,10BC
U 10BC, 0000,003D,0180,0800,0000,117C

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U 10BD, 0000,003C,0180,0800,0000,10BE
U 10BE, 0000,003D,0180,0800,0000,1169
U 10BF, 0003,003C,0180,09F0,0000,10C0
U 10C0, 0000,003D,0180,0800,0000,114E
U 10C1, 0F00,003C,0180,0800,0000,12B0
U 12B0, 0000,003C,1980,3C00,0000,10C2
U 10C2, 0018,0039,1980,0AD0,0000,116E
U 10C3, 0818,0038,3180,0800,0000,12B1
U 12B1, 0000,003C,1980,3C00,0000,12B2
U 12B2, 0818,0038,4180,0800,0000,12B3
U 12B3, 0500,003C,0180,0800,0000,10C4
U 10C4, 0001,003D,0180,0AD0,0000,116E
U 10C5, 0000,003C,0180,0800,0000,12B4
U 12B4, 0000,003C,0180,0800,4000,12B5

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U 12B5, 0F00,003C,39F0,2C00,0000,12B6 :2928      Q_ID[SIR],D_0      ; READ THE IPL ACTIVE BITS
U 12B6, 001C,0034,01C0,0A10,0000,12B7 :2929      Q-Q.AND.R[2]    ; MASK
U 12B7, 001D,2000,0180,0800,0010,12B8 :2930      A[U_Q-D,CLK.UBCC ; CHECK
U 12B8, 0000,013C,0180,0800,0000,10C6 :2931      Z?
U 10C6, 0001,203D,0180,09E8,0000,1151 :2932      ERROR2,RC[OD]_Q ; INTRPT DISABLE DID NOT INHIBIT TRANSMITTER
                                     :2933      ; INTERRUPT.
                                     :2934      ;+
                                     :2935      ; NOW CHECK THAT THE INTERRUPT ENABLE BIT BEING OFF DISABLES THE INTERRUPT
                                     :2936      ; -
                                     :2937
U 10C7, 0000,003C,0180,0800,0000,10C8 :2938      NOP
U 10C8, 0018,0039,1980,0AD0,0000,116E :2939      =0      SETMCR[ZERO]      ; CLEAR INTERPT DISABLE BIT
U 10C9, 0000,003C,0180,0800,0000,10CA :2940      NOP
U 10CA, 0000,003D,0180,0800,0000,114E :2941      =0      ERLOOP
U 10CB, 0F00,003C,0180,0800,0000,12B9 :2942      D_0
U 12B9, 0000,003C,1980,3C00,0000,12BA :2943      ID[TXCS]_D      ; CLEAR INTERRUPT ENABLE BIT
U 12BA, 0818,0038,3180,0800,0000,12BB :2944      D_K[.40]
U 12BB, 0F00,003C,1980,3C00,0000,12BC :2945      ID[TXCS]_D,D_0 ; SET INTERRUPT ENABLE (SETS FLOP)
U 12BC, 0000,003C,1980,3C00,0000,12BD :2946      ID[TXCS]_D      ; CLEAR INTERRUPT ENABLE BIT
                                     :2947      ; SHOULD DISABLE INTRPT REQUEST
                                     :2948      ; ALLOW SYNC TO CLOCK
U 12BD, 0000,003C,0180,0800,0000,12BE :2948      NOP
U 12BE, 0000,003C,0180,0800,4000,12BF :2949      INTRPT.STROBE   ; LATCH THE SYNC SIGNAL
U 12BF, 0F00,003C,39F0,2C00,0000,12C0 :2950      Q_ID[SIR],D_0   ; READ THE IPL ACTIVE BITS
U 12C0, 001D,2000,0180,0800,0010,12C1 :2951      A[U_Q-D,CLK.UBCC ; CHECK IPL ACTIVE FOR ZERO
U 12C1, 0000,013C,0180,0800,0000,10CC :2952      Z?
U 10CC, 0001,203D,0180,09E8,0000,1151 :2953      =0      ERROR2,RC[OD]_Q ; INTRPT ENABLE DID NOT DISABLE INTRP REQ
                                     :2954
                                     :2955
                                     :2956      ;////////////////////
                                     :2957      ;+
                                     :2958      ; NOW CHECK THE RECEIVER INTERRUPT DISABLE
                                     :2959      ; -
                                     :2960
U 10CD, 0000,003C,0180,0800,0000,10CE :2961      T16DS2: NOP
U 10CE, 0000,003D,0180,0800,0000,1169 :2962      =0      SUBTEST
U 10CF, 0000,003C,0180,0800,0000,10D0 :2963      NOP
U 10D0, 0000,003D,0180,0800,0000,114E :2964      =0      ERLOOP
U 10D1, 0F00,003C,0180,0800,0000,12C2 :2965      D_0
U 12C2, 0000,003C,1180,3C00,0000,10D2 :2966      ID[RXC]_D      ; ENSURE INTRPT ENABLE CLEAR
U 10D2, 0018,0039,1980,0AD0,0000,116E :2967      =0      SETMCR[ZERO]    ; ENSURE INTRPT DISABLE CLEAR
U 10D3, 0818,0038,3180,0800,0000,12C3 :2968      D_K[.40]
U 12C3, 0000,003C,1180,3C00,0000,10D4 :2969      ID[RXC]_D      ; SET THE INTERRUPT ENABLE BIT
U 10D4, 0018,0039,4180,0AD0,0000,1174 :2970      =0      SETRXC[.80]    ; SET THE READY BIT
U 10D5, 0818,0038,4180,0800,0000,12C4 :2971      D_K[.80]
U 12C4, 0500,003C,0180,0800,0000,10D6 :2972      D_D.LEFT
U 10D6, 0001,003D,0180,0AD0,0000,116E :2973      =0      R[OA]_D,CALL,J/SETMCR ; GEN PATTERN TO SET INTRPT DISABLE
U 10D7, 0000,003C,0180,0800,0000,12C5 :2974      NOP
U 12C5, 0000,003C,0180,0800,4000,12C6 :2975      SYNCB1: INTRPT.STROBE ; SET THE INTRPT DISABLE BIT
U 12C6, 0F00,003C,39F0,2C00,0000,12C7 :2976      Q_ID[SIR],D_0   ; ALLOW SYNC CXMT TO CLEAR
U 12C7, 001C,0034,01C0,0A10,0000,12C8 :2977      Q-Q.AND.R[2]    ; LATCH THE INTRPT SIGNAL
U 12C8, 001D,2000,0180,0800,0010,12C9 :2978      A[U_Q-D,CLK.UBCC ; READ THE IPL ACTIVE BITS
U 12C9, 0000,013C,0180,0800,0000,10D8 :2979      Z?
U 10D8, 0001,203D,0180,09E8,0000,1151 :2980      =0      ERROR2,RC[OD]_Q ; INTRPT DISABLE DID NOT INHIBIT RECEIVER
                                     :2981      ; INTERRUPT.
                                     :2982

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:2983 :+
:2984 : NOW CHECK THAT THE INTRPT DISABLE BIT DISABLES THE JK FLIP FLOP ON THE
:2985 : CIB MODULE.
:2986 :-
:2987
U 10D9, 0000,003C,0180,0800,0000,10DA :2988 NOP
U 10DA, 0000,003D,0180,0800,0000,114E :2989 =0 ERLOOP
U 10DB, 0000,003C,0180,0800,0000,10DC :2990 NOP
U 10DC, 0018,0039,1980,0AD0,0000,116E :2991 =0 SETMCR[ZERO] ; CLEAR INTRPT DISABLE BIT
U 10DD, 0000,003C,0180,0800,4000,12CA :2992 INTRPT.STROBE ; SET HIR 14
U 12CA, 0F00,003C,0180,0800,8000,12CB :2993 D_0,INTRPT.ACK ; CLEAR THE FLIP FLOP
U 12CB, 0000,003C,1180,3C00,0000,12CC :2994 ID[RXC5]_D ; ENSURE INTRPT ENABLE CLEAR
U 12CC, 0818,0038,4180,0800,4000,12CD :2995 D_K[.80],INTRPT.STROBE ; CLEAR HIR 14
U 12CD, 0500,003C,0180,0800,0000,10DE :2996 D_D.LEFT
U 10DE, 0001,003D,0180,0AD0,0000,116E :2997 =0 R[0A]_D,CALL,J/SETMCR ; SET THE INTRPT DISABLE BIT
U 10DF, 0818,0038,3180,0800,0000,12CE :2998 D_K[.40]
U 12CE, 0000,003C,1180,3C00,0000,10E0 :2999 SYNCB2: ID[RXC5]_D ; SET THE INTRPT ENABLE BIT
:3000 ; FLIP FLOP SHOULD NOT SET
U 10E0, 0018,0039,1980,0AD0,0000,116E :3001 =0 SETMCR[ZERO] ; CLEAR THE INTRPT DISABLE
U 10E1, 0000,003C,0180,0800,0000,12CF :3002 NOP ; ALLOW SYNC CXMT TO CLOCK
U 12CF, 0000,003C,0180,0800,4000,12D0 :3003 INTRPT.STROBE ; STROBE INTRPT IF IT IS THERE
U 12D0, 0F00,003C,39F0,2C00,0000,12D1 :3004 Q_ID[SIR],D_0 ; READ THE IPL ACTIVE BITS
U 12D1, 001C,0034,01C0,0A10,0000,12D2 :3005 Q-Q.AND.R[2] ; MASK
U 12D2, 001D,2000,0180,0800,0010,12D3 :3006 A[U_Q-D,CLK.UBCC ; CHECK
U 12D3, 0000,013C,0180,0800,0000,10E2 :3007 Z?
U 10E2, 0001,203D,0180,09E8,0000,1151 :3008 =0 ERROR2,RC[0D]_Q ; INTRPT DISABLE DID NOT INHIBIT LOADING
:3009 ; THE FLIP FLOP ON CIB
:3010
:3011 :+
:3012 : NOW CHECK THAT THE INTERRUPT ENABLE BIT DISABLES THE INTERRUPT REQUEST
:3013 : WHEN IT IS CLEAR
:3014 :-
:3015
U 10E3, 0000,003C,0180,0800,0000,10E4 :3016 NOP
U 10E4, 0018,0039,1980,0AD0,0000,116E :3017 =0 SETMCR[ZERO] ; CLEAR THE INTRPT DISABLE BIT
U 10E5, 0000,003C,0180,0800,0000,10E6 :3018 NOP
U 10E6, 0000,003D,0180,0800,0000,114E :3019 =0 ERLOOP
U 10E7, 0F00,003C,0180,0800,0000,12D4 :3020 D_0
U 12D4, 0000,003C,1180,3C00,0000,12D5 :3021 ID[RXC5]_D ; CLEAR INTRPT ENABLE BIT
U 12D5, 0818,0038,3180,0800,0000,12D6 :3022 D_K[.40]
U 12D6, 0F00,003C,1180,3C00,0000,12D7 :3023 ID[RXC5]_D,D_0 ; SET THE INTRPT ENABLE
U 12D7, 0000,003C,1180,3C00,0000,12D8 :3024 ID[RXC5]_D ; CLEAR THE BIT, SHOULD DIABLE
:3025 ; INTRPT REQUEST
U 12D8, 0000,003C,0180,0800,0000,12D9 :3026 NOP ; ALLOW SYNC TO CLEAR
U 12D9, 0000,003C,0180,0800,4000,12DA :3027 INTRPT.STROBE ; LATCH THE INTRPT REQ SIGNAL
U 12DA, 0F00,003C,39F0,2C00,0000,12DB :3028 Q_ID[SIR],D_0 ; READ THE IPL ACTIVE BITS
U 12DB, 001D,2000,0180,0800,0010,12DC :3029 A[U_Q-D,CLK.UBCC ; CHECK IPL ACTIVE
U 12DC, 0000,013C,0180,0800,0000,10E8 :3030 Z?
U 10E8, 0001,203D,0180,09E8,0000,1151 :3031 =0 ERROR2,RC[0D]_Q ; INTRPT ENABLE CLEAR DID NOT DISABLE
:3032 ; THE INTRPT REQUEST
:3033
U 10E9, 0000,003C,0180,0800,0000,10EA :3034 =0 SETRXC5[ZERO] ; CLEAR THE READY BIT
U 10EA, 0018,0039,1980,0AD0,0000,1174 :3035 D_0
U 10EB, 0F00,003C,0180,0800,0000,12DD :3036 ID[RXC5]_D ; AND THE INTRPT ENABLE BITS
U 12DD, 0000,003C,1180,3C00,0000,12DE :3037 ID[IXC5]_D ; ...
U 12DE, 0000,003C,1980,3C00,0000,12DF

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ZZ-ESKAH-V132 TEST 16D CONSOLE INTERRUPT DISABLE
ESKAH3C.MCR

MICRO2 1M(01)

16-DEC-82 12:42:53

E 16

SEQ 1225
Page 7

U 12DF, 0000,003C,0180,0800,0000,12E0 ;3038
U 12E0, 0000,003C,0180,0800,4000,10EC ;3039
;3040

NOP
INTRPT.STROBE

; CLEAR THE HIR LEVEL

```

:3041 .PAGE 'TEST 16E ID BUS 'ATEMP' REGISTERS'
:3042 *****
:3043 **
:3044
:3045 TEST 16E ID BUS 'ATEMP' REGISTERS
:3046
:3047 TEST DESCRIPTION
:3048
:3049 THIS TEST CHECKS THE 12 ATEMP REGISTERS ON THE ID BUS.
:3050
:3051 SUBTST 1 - FLOAT A ZERO THRU REGISTER ADDRESS 24
:3052 SUBTST 2 - FLOAT A ONE THRU REGISTER ADDRESS 24
:3053 SUBTST 3 - WRITE A DATA PATTERN IN EACH ADDRESS OF EACH CHIP OF
:3054 THE ATEMP REGISTERS AND CHECK FOR DUAL ADDRESSING.
:3055
:3056 LOGIC DESCRIPTION
:3057 THIS TEST CHECKS SOME OF THE ID BUS ADDRESS DECODE ON THE ICL
:3058 MODULE AND THE ATEMP REGISTERS ON THE ICL AND CEH MODULES.
:3059
:3060 ERROR DESCRIPTION
:3061 DATA: EXPECTED DATA PATTERN
:3062 RECEIVED DATA PATTERN
:3063 LOOP COUNT FOR SUBTESTS 1 AND 2, ATEMP REGISTER ADDRESS
:3064 FOR SUBTEST 3.
:3065 THE LOOP COUNT INDICATES WHICH BIT IS BEING TESTED, I.E.
:3066 20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
:3067 THE REGISTER ADDRESS INDICATES WHICH REGISTER WAS DUAL ADDRESSED
:3068 WHILE WRITING THE ATEMP REGISTERS.
:3069
:3070 SYNC POINT DESCRIPTION
:3071 SUBTST 1 - SYNC00--ATEMP REGISTER IS LOADED
:3072 SYNC01--ATEMP IS READ
:3073 SUBTST 2 - SYNC02--ATEMP REGISTER IS LOADED
:3074 SYNC03--ATEMP IS READ
:3075 SUBTST 3 - SYNC04--ATEMP REGISTERS ARE LOADED WITH THE PATTERN
:3076 SYNC05--ATEMP REGISTERS ARE READ.
:3077 NOTE: SINCE SYNC04 AND SYNC05 ARE WITHIN LOOPS, YOU MAY HAVE
:3078 TO STEP TO THE WRITE OR READ OF THE APPROPRIATE
:3079 REGISTER.
:3080
:3081 *****
:3082 =0
:3083 T16E: NEWTST
:3084 RC[0F]_K[.3]
:3085
:3086 :////////////////////
:3087 :
:3088 : FIRST FLOAT A ZERO THRU THE ATEMP REGISTER AT ADDRESS 24
:3089 :-
:3090
:3091 T16E1: RC[0C]_K[.20] ; SET THE LOOP COUNT
:3092 =0 SUBTEST
:3093 SC_K[.24] ; SET THE ATEMP ADDRESS
:3094 D_R[.FFFF] ; GENERATE THE INITIAL DATA PATTERN
:3095 D_D.SXT[WORD]+K[.2] ; ...

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U 10EC, 0000,003D,0180,0800,0000,113A

U 10ED, 0018,0038,0D80,09F8,0000,12E1

U 12E1, 0018,0038,7580,09E0,0000,10EE

U 10EE, 0000,003D,0180,0800,0000,1169

U 10EF, 0000,003C,E980,0800,0084,72E2

U 12E2, 0818,0038,F180,0800,0000,12E3

U 12E3, 081A,4014,0980,0800,0000,12E4

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U 12E4, 0001,003C,0180,09F0,0000,10F0 :3096      RC[OE]_D           : SAVE
U 10F0, 0000,003D,0180,0800,0000,114E :3097      =0          ERLOOP
U 10F1, 0810,0038,0180,0970,0000,12E5 :3098      T16EL1: D RC[OE]      : GET THE DATA PATTERN
U 12E5, 0000,003C,0180,3400,0000,12E6 :3099      SYNC00: ID(SC) D      : WRITE THE REGISTER
U 12E6, 0000,003C,01F0,2400,0000,12E7 :3100      SYNC01: Q ID(SC)      : READ THE REGISTER
U 12E7, 001D,A000,0180,0800,0010,12E8 :3101      A[U_Q-D,CLK,UBCC,BYTE : CHECK THE DATA
U 12E8, 0000,013C,0180,0800,0000,10F2 :3102      Z?              : BRANCH IF OK
U 10F2, 0001,203D,0180,09E8,0000,1151 :3103      =0          ERROR2,RC[OD]_Q
:3104
:3105      :+
:3106      : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3107      :-
:3108
U 10F3, 0010,0038,01C0,0970,0000,12E9 :3109      Q_RC[OE]           : GET CURRENT DATA PATTERN
U 12E9, 0000,003C,03A8,0800,0000,12EA :3110      Q_Q.LEFT,S1/MUL-      : GENERATE NEXT PATTERN
U 12EA, 0001,203C,0180,09F0,0000,12EB :3111      RC[OE]_Q           : SAVE
U 12EB, 0810,0038,0180,0960,0000,12EC :3112      D_RC[OC]          : GET THE LOOP COUNT
U 12EC, 0019,8000,0580,09E0,0010,12ED :3113      RC[OC]_D-K[.1],CLK,UBCC,BYTE : DECREMENT AND CHECK
U 12ED, 0000,013C,0180,0800,0000,10F4 :3114      Z?
U 10F4, 0000,003C,0180,0800,0000,10F1 :3115      =0          J/T16EL1      : CONTINUE TESTING
:3116
:3117      :////////////////////
:3118      :+
:3119      : NOW FLOAT A ONE THRU ATEMP REGISTER 24
:3120      :-
:3121
U 10F5, 0018,0038,7580,09E0,0000,10F6 :3122      T16ES2: RC[OC]_K[.20]      : SET THE LOOP COUNT
U 10F6, 0000,003D,0180,0800,0000,1169 :3123      =0          SUBTEST
U 10F7, 0018,0038,0580,09F0,0000,10F8 :3124      RC[OE]_K[.1]          : INITIALIZE THE DATA PATTERN
U 10F8, 0000,003D,0180,0800,0000,114E :3125      =0          ERLOOP
U 10F9, 0810,0038,0180,0970,0000,12EE :3126      T16EL2: D RC[OE]      : GET THE DATA PATTERN
U 12EE, 0000,003C,0180,3400,0000,12EF :3127      SYNC02: ID(SC) D      : LOAD THE REGISTER
U 12EF, 0000,003C,01F0,2400,0000,12F0 :3128      SYNC03: Q ID(SC)      : READ THE REGISTER
U 12F0, 001D,2000,0180,0800,0010,12F1 :3129      A[U_Q-D,CLK,UBCC      : CHECK THE DATA
U 12F1, 0000,013C,0180,0800,0000,10FA :3130      Z?              : BRANCH IF OK
U 10FA, 0001,203D,0180,09E8,0000,1151 :3131      =0          ERROR2,RC[OD]_Q : ATEMP DATA PATH FAILED
:3132
:3133      :+
:3134      : THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3135      :-
:3136
U 10FB, 0010,0038,01C0,0970,0000,12F2 :3137      Q_RC[OE]           : GET THE DATA PATTERN
U 12F2, 0021,203C,0180,09F0,0000,12F3 :3138      RC[OE]_Q.LEFT        : GENERATE NEXT PATTERN
U 12F3, 0810,0038,0180,0960,0000,12F4 :3139      D_RC[OC]          : GET THE LOOP COUNT
U 12F4, 0019,8000,0580,09E0,0010,12F5 :3140      RC[OC]_D-K[.1],CLK,UBCC,BYTE : DECREMENT AND CHECK
U 12F5, 0000,013C,0180,0800,0000,10FC :3141      Z?
U 10FC, 0000,003C,0180,0800,0000,10F9 :3142      =0          J/T16EL2      : CONTINUE
:3143
:3144      :////////////////////
:3145      :+
:3146      : NOW WRITE A DATA PATTERN IN ALL 12 ATEMP REGISTERS AND READ IT BACK
:3147      : AND CHECK IT. THIS IS A DUAL ADDRESSING TEST.
:3148      :-
:3149
U 10FD, 0818,0038,6580,0800,0000,12F6 :3150      T16ES3: D_K[.10]          : GENERATE THE DATA PATTERN

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U 12F6, 0819,0014,0580,0A80,0000,12F7 :3151      R[0] D+K[.1],D_ALU      : TO INCREMENT THE DATA
U 12F7, 0000,003C,0180,0A00,0000,12F8 :3152      LAB R[0]          : PATTERN THAT GETS WRITTEN
U 12F8, 0000,003C,01F8,0800,0084,72F9 :3153      SC R[.8],Q_0      : INTO EACH OF THE ATEMP
U 12F9, 0D00,003C,0180,0800,0000,12FA :3154      D_DAL.SC          : REGISTERS
U 12FA, 081C,2014,0180,0800,0000,12FB :3155      D_LA+D              : ...
U 12FB, 0D00,003C,0180,0800,0000,12FC :3156      D_DAL.SC          : ...
U 12FC, 081C,2014,0180,0800,0000,12FD :3157      D_LA+D              : ...
U 12FD, 0D00,003C,0180,0800,0000,12FE :3158      D_DAL.SC          : ...
U 12FE, 001C,2014,0180,0A80,0000,10FE :3159      R[0] LA+D          : EQUALS 11111111
U 10FE, 0000,003D,0180,0800,0000,1169 :3160      SUBTEST          :
U 10FF, 0818,0038,7980,0800,0000,12FF :3161      D_K[.30]          :
U 12FF, 0019,0000,0580,0A88,0000,110A :3162      R[1]_D-K[.1]      : GENERATE A CONSTANT 2F
:3163
U 110A, 0000,003D,0180,0800,0000,114E :3164      ERLOOP          :
U 110B, 0F00,003C,E980,0800,0084,7302 :3165      SC_K[.24],D_0      : SET ADDRESS OF FIRST ATEMP AND
:3166      : INITIAL DATA PATTERN
:3167
U 1302, 0000,003C,0180,3600,0000,1303 :3168      SYNC04: ID(SC)_D,LAB_R[0] : LOAD THE REGISTER
U 1303, 081C,2014,0180,0800,0000,1304 :3169      T16EL3: D_LA+D        : INCREMENT PATTERN TO WRITE
U 1304, 0000,003C,01C0,0A08,0000,1305 :3170      Q_R[1]            :
U 1305, 0019,A000,1D80,0800,0010,1306 :3171      A[U_Q-SC,CLK.UBCC,BYTE : FINISHED LOADING YET?
U 1306, 0000,013C,0180,0800,0080,D110 :3172      Z?,SC_SC+1        : BRANCH IF YES
U 1110, 0000,003C,0180,0800,0000,1302 :3173      J/T16EL3          : CONTINUE LOADING
:3174
:3175      ;+
:3176      ; NOW READ EACH ATEMP
:3177      ; -
:3178
U 1111, 0000,003C,E980,0800,0084,7307 :3179      SC_K[.24]          : SET THE START ADDRESS
U 1307, 0003,003C,0180,09F0,0000,1308 :3180      R[0E] 0            : INIT THE EXPECTED DATA
U 1308, 0018,0038,1D80,09E0,0000,1309 :3181      T16EL4: R[0C]-SC    : SAVE CURRENT ATEMP ADDRESS
U 1309, 0810,0038,0180,0970,0000,130A :3182      D_R[0E]          : GET EXPECTED DATA
U 130A, 0000,003C,01F0,2400,0000,130B :3183      SYNC05: Q_ID(SC)    : READ THE REGISTER
U 130B, 001D,2000,0180,0800,0010,130C :3184      A[U_Q-D,CLK.UBCC    : CHECK THE DATA
U 130C, 0000,013C,0180,0800,0000,1112 :3185      Z?                : BRANCH IF OK
U 1112, 0001,203D,0180,09E8,0000,1151 :3186      =0 ERROR2,R[0D],Q : DATA CHANGED IN ONE OF THE REGISTERS
:3187
:3188      ;+
:3189      ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3190      ; -
:3191
U 1113, 0810,0038,0180,0970,0000,130D :3192      D_R[0E]          : GET CURRENT EXPECTED DATA
U 130D, 0000,003C,0180,0A00,0000,130E :3193      LAB R[0]          : LATCH INCREMENT CONSTANT
U 130E, 001C,2014,0180,09F0,0000,130F :3194      R[0E]_LA+D        : SET NEXT EXPECTED DATA
U 130F, 0000,003C,01C0,0A08,0000,1310 :3195      Q_R[1]            :
U 1310, 0019,A000,1D80,0800,0010,1311 :3196      A[U_Q-SC,CLK.UBCC,BYTE : DONE CHECKING YET?
U 1311, 0000,013C,0180,0800,0080,D114 :3197      Z?,SC_SC+1        : BRANCH IF YES
U 1114, 0000,003C,0180,0800,0000,130B :3198      J/T16EL4          : CONTINUE CHECKING
U 1115, 0000,003C,0180,0800,0000,1116 :3199      NOP

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:3200 .PAGE 'TEST 16F ID BUS 'BTEMP' REGISTERS'
:3201 .....
:3202 ++
:3203
:3204 TEST 16F ID BUS 'BTEMP' REGISTERS
:3205
:3206 TEST DESCRIPTION
:3207
:3208 THIS TEST CHECKS THE 12 BTEMP REGISTERS ON THE ID BUS.
:3209
:3210 SUBTST 1 - FLOAT A ZERO THRU REGISTER ADDRESS 24
:3211 SUBTST 2 - FLOAT A ONE THRU REGISTER ADDRESS 24
:3212 SUBTST 3 - WRITE A DATA PATTERN IN EACH ADDRESS OF EACH CHIP OF
:3213 THE BTEMP REGISTERS AND CHECK FOR DUAL ADDRESSING.
:3214
:3215 LOGIC DESCRIPTION
:3216 THIS TEST CHECKS SOME OF THE ID BUS ADDRESS DECODE ON THE ICL
:3217 MODULE AND THE BTEMP REGISTERS ON THE ICL AND CEM MODULES.
:3218
:3219 ERROR DESCRIPTION
:3220 DATA: EXPECTED DATA PATTERN
:3221 RECEIVED DATA PATTERN
:3222 LOOP COUNT FOR SUBTESTS 1 AND 2, BTEMP REGISTER ADDRESS
:3223 FOR SUBTEST 3.
:3224 THE LOOP COUNT INDICATES WHICH BIT IS BEING TESTED, I.E.
:3225 20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
:3226 THE REGISTER ADDRESS INDICATES WHICH REGISTER WAS DUAL ADDRESSED
:3227 WHILE WRITING THE BTEMP REGISTERS.
:3228
:3229 SYNC POINT DESCRIPTION
:3230 SUBTST 1 - SYNC06--BTEMP REGISTER IS LOADED
:3231 SYNC07--BTEMP IS READ
:3232 SUBTST 2 - SYNC08--BTEMP REGISTER IS LOADED
:3233 SYNC09--BTEMP IS READ
:3234 SUBTST 3 - SYNC0A--BTEMP REGISTERS ARE LOADED WITH THE PATTERN
:3235 SYNC0B--BTEMP REGISTERS ARE READ.
:3236 NOTE: SINCE SYNC0A AND SYNC0B ARE WITHIN LOOPS, YOU MAY HAVE
:3237 TO STEP TO THE WRITE OR READ OF THE APPROPRIATE
:3238 REGISTER.
:3239 --
:3240 .....
:3241 =0
:3242 T16F: NEWTST
:3243 RC[0F]_K[.3]
:3244
:3245 :////////////////////
:3246 :+
:3247 : FIRST FLOAT A ZERO THRU THE BTEMP REGISTER AT ADDRESS 24
:3248 :-
:3249
:3250 T16FS1: RC[0C]_K[.20] ; SET THE LOOP COUNT
:3251 =0 SUBTST
:3252 SC_K[.30] ; SET THE BTEMP ADDRESS
:3253 D_R[.FFFF] ; GENERATE THE INITIAL DATA PATTERN
:3254 D_D.SXT[WORD]+K[.2] ; ...

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U 1116, 0000,003D,0180,0800,0000,113A
U 1117, 0018,0038,0D80,09F8,0000,1312

U 1312, 0018,0038,7580,09E0,0000,1118
U 1118, 0000,003D,0180,0800,0000,1169
U 1119, 0000,003C,7980,0800,0084,7313
U 1313, 0818,0038,F180,0800,0000,1314
U 1314, 081A,4014,0980,0800,0000,1315

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U 1315, 0001,003C,0180,09F0,0000,111A :3255 RC[OE]_D ; SAVE
U 111A, 0000,003D,0180,0800,0000,114E :3256 =0 ERLOOP-
U 111B, 0810,0038,0180,0970,0000,1316 :3257 T16FL1: D RC[OE] ; GET THE DATA PATTERN
U 1316, 0000,003C,0180,3400,0000,1317 :3258 SYNC06: ID(SC) D ; WRITE THE REGISTER
U 1317, 0000,003C,01F0,2400,0000,1318 :3259 SYNC07: Q ID(SC) ; READ THE REGISTER
U 1318, 001D,A000,0180,0800,0010,1319 :3260 A[U_Q-D,CLK.UBCC,BYTE ; CHECK THE DATA
U 1319, 0000,013C,0180,0800,0000,111C :3261 Z? ; BRANCH IF OK
U 111C, 0001,203D,0180,09E8,0000,1151 :3262 =0 ERROR2,RC[OD]_Q
:3263
:3264 ;+
:3265 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3266 :-
:3267
U 111D, 0010,0038,01C0,0970,0000,131A :3268 Q_RC[OE] ; GET CURRENT DATA PATTERN
U 131A, 0000,003C,03A8,0800,0000,131B :3269 Q_Q.LEFT,S1/MUL- ; GENERATE NEXT PATTERN
U 131B, 0001,203C,0180,09F0,0000,131C :3270 RC[OE] Q ; SAVE
U 131C, 0810,0038,0180,0960,0000,131D :3271 D RC[OE] ; GET THE LOOP COUNT
U 131D, 0019,80C0,0580,09E0,0010,131E :3272 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
U 131E, 0000,013C,0180,0800,0000,111E :3273 Z?
U 111E, 0000,003C,0180,0800,0000,111B :3274 =0 J/T16FL1 ; CONTINUE TESTING
:3275
:3276 ;////////////////////
:3277 ;+
:3278 ; NOW FLOAT A ONE THRU BTEMP REGISTER 24
:3279 :-
:3280
U 111F, 0018,0038,7580,09E0,0000,1120 :3281 T16FS2: RC[OC] K[.20] ; SET THE LOOP COUNT
U 1120, 0000,003D,0180,0800,0000,1169 :3282 =0 SUBTEST
U 1121, 0018,0038,0580,09F0,0000,1122 :3283 RC[OE] K[.1] ; INITIALIZE THE DATA PATTERN
U 1122, 0000,003D,0180,0800,0000,114E :3284 =0 ERLOOP-
U 1123, 0810,0038,0180,0970,0000,131F :3285 T16FL2: D RC[OE] ; GET THE DATA PATTERN
U 131F, 0000,003C,0180,3400,0000,1320 :3286 SYNC08: ID(SC) D ; LOAD THE REGISTER
U 1320, 0000,003C,01F0,2400,0000,1321 :3287 SYNC09: Q ID(SC) ; READ THE REGISTER
U 1321, 001D,2000,0180,0800,0010,1322 :3288 A[U_Q-D,CLK.UBCC ; CHECK THE DATA
U 1322, 0000,013C,0180,0800,0000,1124 :3289 Z? ; BRANCH IF OK
U 1124, 0001,203D,0180,09E8,0000,1151 :3290 =0 ERROR2,RC[OD]_Q ; BTEMP DATA PATH FAILED
:3291
:3292 ;+
:3293 ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3294 :-
:3295
U 1125, 0010,0038,01C0,0970,0000,1323 :3296 Q_RC[OE] ; GET THE DATA PATTERN
U 1323, 0021,203C,0180,09F0,0000,1324 :3297 RC[OE] Q.LEFT ; GENERATE NEXT PATTERN
U 1324, 0810,0038,0180,0960,0000,1325 :3298 D RC[OE] ; GET THE LOOP COUNT
U 1325, 0019,8000,0580,09E0,0010,1326 :3299 RC[OC]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT AND CHECK
U 1326, 0000,013C,0180,0800,0000,1126 :3300 Z?
U 1126, 0000,003C,0180,0800,0000,1123 :3301 =0 J/T16FL2 ; CONTINUE
:3302
:3303 ;////////////////////
:3304 ;+
:3305 ; NOW WRITE A DATA PATTERN IN ALL 12 BTEMP REGISTERS AND READ IT BACK
:3306 ; AND CHECK IT. THIS IS A DUAL ADDRESSING TEST.
:3307 :-
:3308
U 1127, 0818,0038,6580,0800,0000,1327 :3309 T16FS3: D_K[.10] ; GENERATE THE DATA PATTERN

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U 1327, 0819,0014,0580,0A80,0000,1328 :3310      R[0] D+K[.1],D_ALU      ; TO INCREMENT THE DATA
U 1328, 0000,003C,0180,0A00,0000,1329 :3311      LAB R[0]          ; PATTERN THAT GETS WRITTEN
U 1329, 0000,003C,01F8,0800,0084,732A :3312      SC R[.8],Q_0      ; INTO EACH OF THE BTEMP
U 132A, 0000,003C,0180,0800,0000,132B :3313      D_DAL.SC          ; REGISTERS
U 132B, 081C,2014,0180,0800,0000,132C :3314      D_LA+D            ; ...
U 132C, 0000,003C,0180,0800,0000,132D :3315      D_DAL.SC          ; ...
U 132D, 081C,2014,0180,0800,0000,132E :3316      D_LA+D            ; ...
U 132E, 0000,003C,0180,0800,0000,132F :3317      D_DAL.SC          ; ...
U 132F, 001C,2014,0180,0A80,0000,1128 :3318      R[0] LA+D          ; EQUALS 11111111
U 1128, 0000,003D,0180,0800,0000,1169 :3319      =0 SUBTEST
:3320
U 1129, 0000,003C,0180,0800,0000,112A :3321      NOP
U 112A, 0000,003D,0180,0800,0000,114E :3322      =0 ERLOOP
U 112B, 0F00,003C,7980,0800,0084,7330 :3323      SC_K[.30],D_0      ; SET ADDRESS OF FIRST BTEMP AND
:3324      ; INITIAL DATA PATTERN
:3325      SYNCOA:
T16FL3: 3326      ID(SC)_D,LAB_R[0]      ; LOAD THE REGISTER
:3327      D_LA+D            ; INCREMENT PATTERN TO WRITE
:3328      Q_K[.3F]
:3329      A[U_Q-SC,CLK.UBCC,BYTE
:3330      Z?,SC SC+1
:3331      =0 J/T16FL3      ; FINISHED LOADING YET?
:3332      ; BRANCH IF YES
:3333      ; CONTINUE LOADING
:3334      ;+ NOW READ EACH BTEMP
:3335      ;-
:3336
U 112D, 0000,003C,7980,0800,0084,7335 :3337      SC_K[.30]      ; SET THE START ADDRESS
U 1335, 0003,003C,0180,09F0,0000,1336 :3338      RC[OE]_0          ; INIT THE EXPECTED DATA
U 1336, 0018,0038,1D80,09E0,0000,1337 :3339      T16FL4: RC[OC]-SC      ; SAVE CURRENT BTEMP ADDRESS
U 1337, 0810,0038,0180,0970,0000,1338 :3340      D_RC[OE]          ; GET EXPECTED DATA
U 1338, 0000,003C,01F0,2400,0000,1339 :3341      SYNCOB: Q-ID(SC)      ; READ THE REGISTER
U 1339, 001D,2000,0180,0800,0010,133A :3342      A[U_Q-D,CLK.UBCC      ; CHECK THE DATA
U 133A, 0000,013C,0180,0800,0000,112E :3343      Z?                ; BRANCH IF OK
U 112E, 0001,203D,0180,09E8,0000,1151 :3344      =0 ERROR2,RC[OD]_Q    ; DATA CHANGED IN ONE OF THE REGISTERS
:3345
:3346      ;+ THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
:3347      ;-
:3348
:3349
U 112F, 0810,0038,0180,0970,0000,133B :3350      D_RC[OE]          ; GET CURRENT EXPECTED DATA
U 133B, 0000,003C,0180,0A00,0000,133C :3351      LAB R[0]          ; LATCH INCREMENT CONSTANT
U 133C, 001C,2014,0180,09F0,0000,133D :3352      RC[OE] LA+D        ; SET NEXT EXPECTED DATA
U 133D, 0018,0038,55C0,0800,0000,133E :3353      Q_K[.3F]
U 133E, 0019,A000,1D80,0800,0010,133F :3354      A[U_Q-SC,CLK.UBCC,BYTE
U 133F, 0000,013C,0180,0800,0080,D130 :3355      Z?,SC SC+1
U 1130, 0000,003C,0180,0800,0000,1336 :3356      =0 J/T16FL4
U 1131, 0000,003C,0180,0800,0000,1132 :3357      NOP
:3358
:3359      =0
U 1132, 0000,003D,0180,0800,0000,113A :3360      T170: NEWTST
U 1133, 0000,003C,0180,0800,0000,1340 :3361      NOP
U 1340, 0000,003D,0180,0800,0000,113A :3362      ENDTST: NEWTST

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:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 0000	- OFFF	Unused						
U 1000	1876:	1845	1847=	1866=	1867=	1868=	1884=	1885=
U 1008	2058=	2060=	2063=	2065=	2068=	2070=	2102=	2103=
U 1010	2104=	2105=	2106=	2108=	2144=	2145=	2146=	2147=
U 1018	2148=	2149=	2150=	2157=	2161=	2162=	2163=	2164=
U 1020	2170=	2171=	2179=	2186=	2187=	2188=	2190=	2191=
U 1028	2197=	2198=	2206=	2207=	2243=	2244=	2245=	2246=
U 1030	2256=	2257=	2258=	2259=	2267=	2268=	2276=	2284=
U 1038	2285=	2286=	2292=	2293=	2301=	2302=	2309=	2310=
U 1040	2319=	2320=	2326=	2327=	2335=	2336=	2343=	2351=
U 1048	2352=	2353=	2359=	2360=	2368=	2369=	1920:	2646=
U 1050	2378=	2379=	2422=	2423=	2425=	2426=	2438=	2439=
U 1058	2449=	2450=	1924:	1846	2461=	2462=	1928:	2647=
U 1060	2471=	2479=	2480=	2481=	2491=	2492=	2503=	2504=
U 1068	2513=	2521=	2522=	2523=	2533=	2534=	2545=	2546=
U 1070	2555=	2556=	2615=	2616=	2617=	2618=	2619=	2620=
U 1078	2621=	2622=	2624=	2625=	2629=	2630=	2634=	2635=
U 1080	2648=	2650=	2652=	1869	2654=	2655=	2660=	2661=
U 1088	2665=	2666=	2673=	2674=	2685=	2686=	2727=	2728=
U 1090	2649=	2651=	2653=	1870	2733=	2741=	2742=	2743=
U 1098	2747=	2748=	2749=	2750=	2758=	2764=	2765=	2766=
U 10A0	2767=	2768=	2772=	2778=	2787=	2788=	2789=	2796=
U 10A8	2798=	2799=	2809=	2810=	2815=	2821=	2823=	2824=
U 10B0	2828=	2834=	2835=	2836=	2845=	2853=	2854=	2855=
U 10B8	2867=	2869=	2901=	2902=	2907=	2914=	2915=	2916=
U 10C0	2917=	2918=	2920=	2921=	2925=	2926=	2932=	2938=
U 10C8	2939=	2940=	2941=	2942=	2953=	2961=	2962=	2963=
U 10D0	2964=	2965=	2967=	2968=	2970=	2971=	2973=	2974=
U 10D8	2980=	2988=	2989=	2990=	2991=	2992=	2997=	2998=
U 10E0	3001=	3002=	3008=	3016=	3017=	3018=	3019=	3020=
U 10E8	3031=	3033=	3034=	3035=	3083=	3084=	3092=	3093=
U 10F0	3097=	3098=	3103=	3109=	3115=	3122=	3123=	3124=
U 10F8	3125=	3126=	3131=	3137=	3142=	3150=	3160=	3161=
U 1100	1831:	1832:	1833:	1834:	1835:	1836:	1837:	1838:
U 1108	1839:	1871	3164=	3165=	1840:	1841:	1842:	1843:
U 1110	3173=	3179=	3186=	3192=	3198=	3199=	3242=	3243=
U 1118	3251=	3252=	3256=	3257=	3262=	3268=	3274=	3281=
U 1120	3282=	3283=	3284=	3285=	3290=	3296=	3301=	3309=
U 1128	3319=	3321=	3322=	3323=	3331=	3337=	3344=	3350=
U 1130	3356=	3357=	3360=	3361=	1872	1873	1874	1875
U 1138	1882	1883	1897	1898	1899	1900	1901	1902
U 1140	1903	1904	1905	1906	1907	1908	1909	1910
U 1148	1911	1912	1913	1914	1915	1916	1917	1918
U 1150	1919	1922	1923	1966	1967	2012:	1968	1969
U 1158	1970	1971	1972	1973	1974	1975	1976	1977
U 1160	1978	1979	1980	1981	1983	1984	1985	1986
U 1168	1988	1998	1999	2007	2008	2009	2032	2033
U 1170	2034	2035	2036	2038	2039	2040	2041	2043
U 1178	2044	2045	2046	2047	2053	2054	2055	2056
U 1180	2057	2061	2062	2066	2067	2071	2072	2083
U 1188	2084	2085	2086	2087	2088	2089	2158	2159
U 1190	2160	2165	2166	2167	2168	2169	2172	2173
U 1198	2174	2175	2176	2177	2178	2189	2192	2193

:Location	0/8	1/9	2/A	3/B	4/C	5/D	6/E	7/F
U 11A0	2194	2195	2196	2199	2200	2201	2202	2203
U 11A8	2204	2205	2247	2248	2260	2261	2262	2263
U 11B0	2264	2265	2266	2269	2270	2271	2272	2273
U 11B8	2274	2275	2287	2288	2289	2290	2291	2294
U 11C0	2295	2296	2297	2298	2299	2300	2303	2304
U 11C8	2305	2306	2307	2308	2318	2321	2322	2323
U 11D0	2324	2325	2328	2329	2330	2331	2332	2333
U 11D8	2334	2337	2338	2339	2340	2341	2342	2354
U 11E0	2355	2356	2357	2358	2361	2362	2363	2364
U 11E8	2365	2366	2367	2370	2371	2372	2373	2374
U 11F0	2375	2376	2377	2424	2427	2428	2429	2430
U 11F8	2437	2440	2441	2442	2443	2444	2445	2446
U 1200	2447	2448	2451	2452	2453	2454	2455	2456
U 1208	2457	2458	2459	2460	2463	2464	2465	2466
U 1210	2467	2468	2469	2470	2482	2483	2484	2485
U 1218	2486	2487	2488	2489	2490	2493	2494	2495
U 1220	2496	2497	2498	2499	2500	2501	2502	2505
U 1228	2506	2507	2508	2509	2510	2511	2512	2524
U 1230	2525	2526	2527	2528	2529	2530	2531	2532
U 1238	2535	2536	2537	2538	2539	2540	2541	2542
U 1240	2543	2544	2547	2548	2549	2550	2551	2552
U 1248	2553	2554	2623	2626	2627	2628	2631	2632
U 1250	2633	2636	2637	2644	2645	2656	2657	2658
U 1258	2659	2662	2663	2664	2667	2668	2669	2670
U 1260	2671	2672	2675	2676	2677	2678	2679	2680
U 1268	2681	2682	2683	2684	2729	2730	2731	2732
U 1270	2744	2745	2746	2751	2752	2753	2754	2755
U 1278	2756	2757	2769	2770	2771	2779	2780	2781
U 1280	2782	2783	2784	2785	2786	2797	2800	2801
U 1288	2802	2803	2804	2805	2806	2807	2808	2811
U 1290	2812	2813	2814	2822	2825	2826	2827	2837
U 1298	2838	2839	2840	2841	2842	2843	2844	2856
U 12A0	2857	2858	2859	2860	2861	2862	2863	2864
U 12A8	2865	2866	2015:	2870	2903	2904	2905	2906
U 12B0	2919	2922	2923	2924	2927	2928	2929	2930
U 12B8	2931	2943	2944	2945	2946	2948	2949	2950
U 12C0	2951	2952	2966	2969	2972	2975	2976	2977
U 12C8	2978	2979	2993	2994	2995	2996	2999	3003
U 12D0	3004	3005	3006	3007	3021	3022	3023	3024
U 12D8	3026	3027	3028	3029	3030	3036	3037	3038
U 12E0	3039	3091	3094	3095	3096	3099	3100	3101
U 12E8	3102	3110	3111	3112	3113	3114	3127	3128
U 12F0	3129	3130	3138	3139	3140	3141	3151	3152
U 12F8	3153	3154	3155	3156	3157	3158	3159	3162
U 1300	2013:	2014:	3168	3169	3170	3171	3172	3180
U 1308	3181	3182	3183	3184	3185	3193	3194	3195
U 1310	3196	3197	3250	3253	3254	3255	3258	3259
U 1318	3260	3261	3269	3270	3271	3272	3273	3286
U 1320	3287	3288	3289	3297	3298	3299	3300	3310
U 1328	3311	3312	3313	3314	3315	3316	3317	3318
U 1330	3326	3327	3328	3329	3330	3338	3339	3340
U 1338	3341	3342	3343	3351	3352	3353	3354	3355
U 1340	3362							

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ESKAH3C.MCR

MICRO2

1M(01)

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C 1

SEQ 1234
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;Location 0/8 1/9 2/A 3/B 4/C 5/D 6/E 7/F

U 1348 - 13EF Unused

U 13F0	1934:	1935:	1936:	1937:	1938:	1939:	1940:	1941:
U 13F8	1942:	1943:	1944:	1945:	1946:	1947:	1948:	1949:

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ESKAH3C.MCR

MICRO2 1M(01)

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D 1

SEQ 1235
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Words not
in bounds

ESK00DEF	0
ESK00MAC	0
ESKAHMAC	0
ESKAH3C	849

Used 849
Remaining

Total microwords used in memory U: 849
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)

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ESKAH3C.MCR

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E 1

SEQ 1236
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; The files used in this assembly are:

ESKOODEF.MIC
ESKOO MAC.MIC
ESKAHMAC.MIC
ESKAH3C.MIC

Pass 1 warnings:	0	Pass 2 warnings:	0
Pass 1 errors:	0	Pass 2 errors:	0